Marine Review

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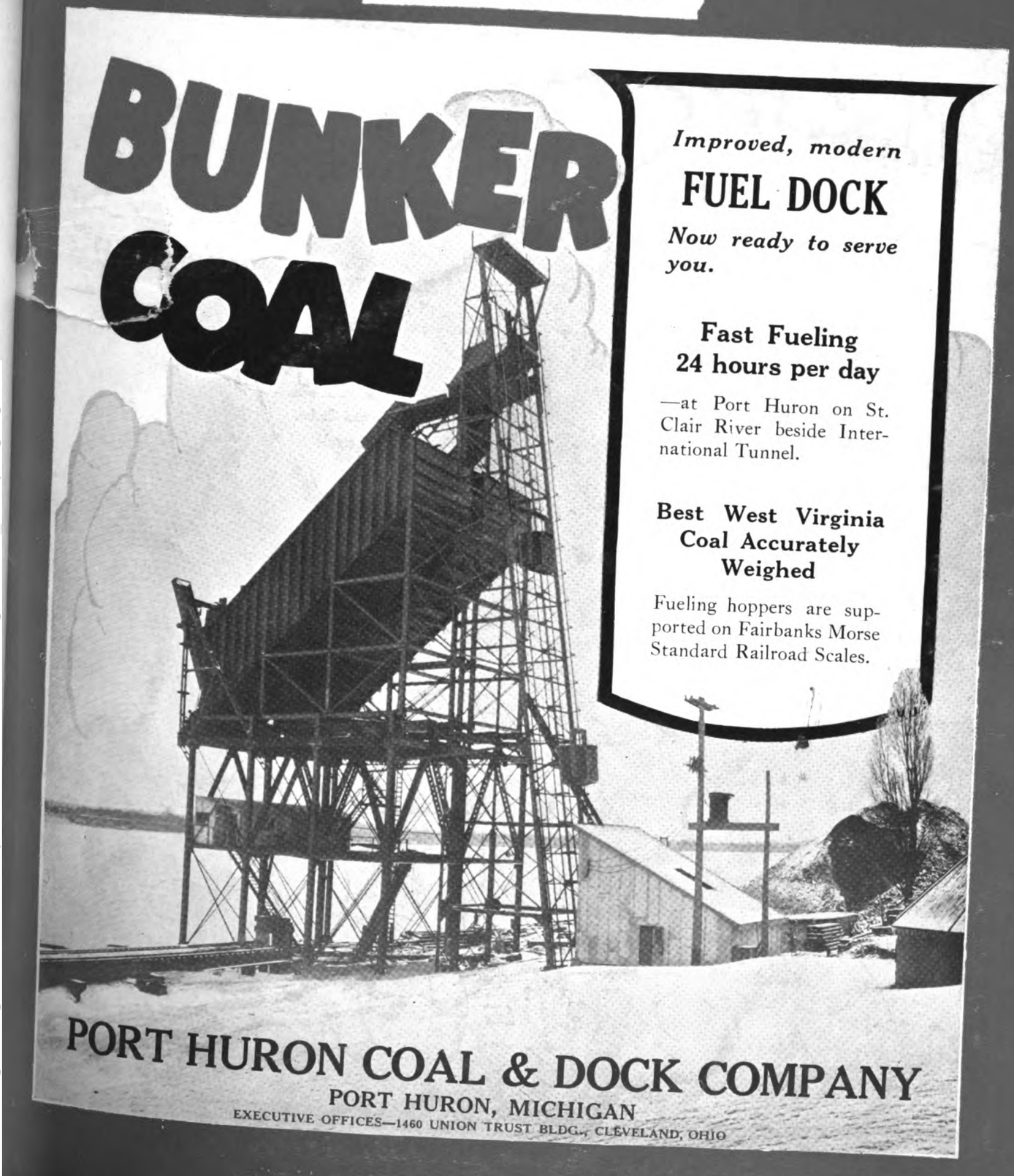
The National Publication Covering the Business of Transportation by Water

March, 1927



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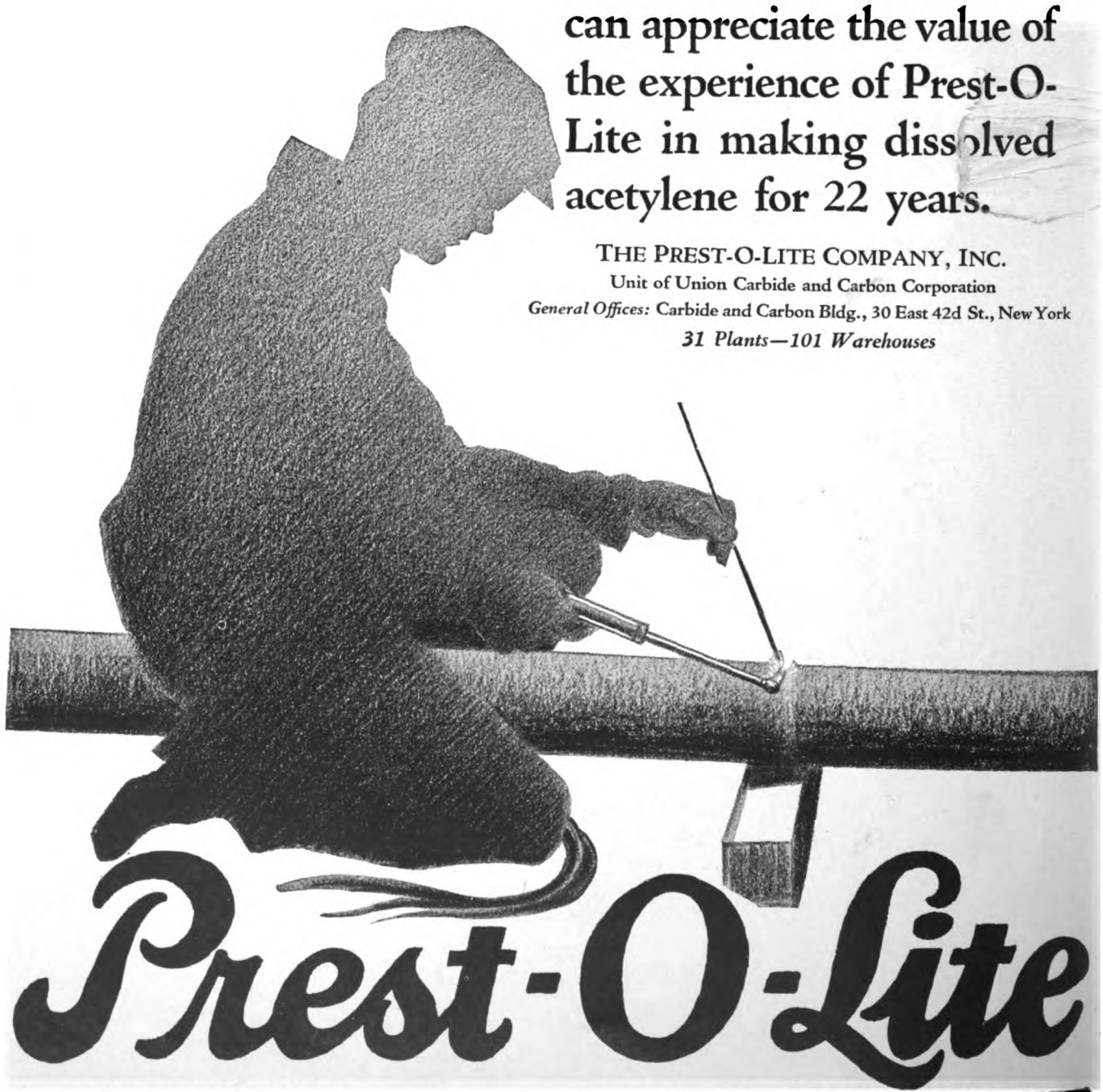

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Marine Review

The National Publication Covering the Business of Transportation by Water

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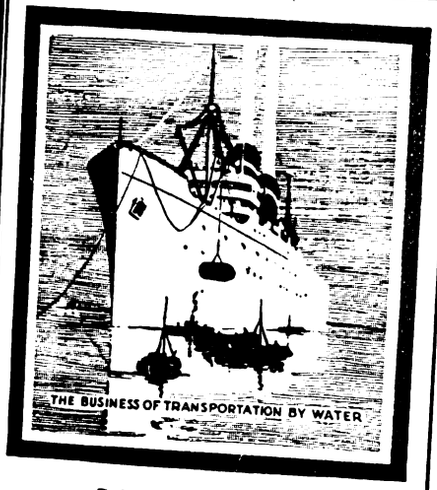

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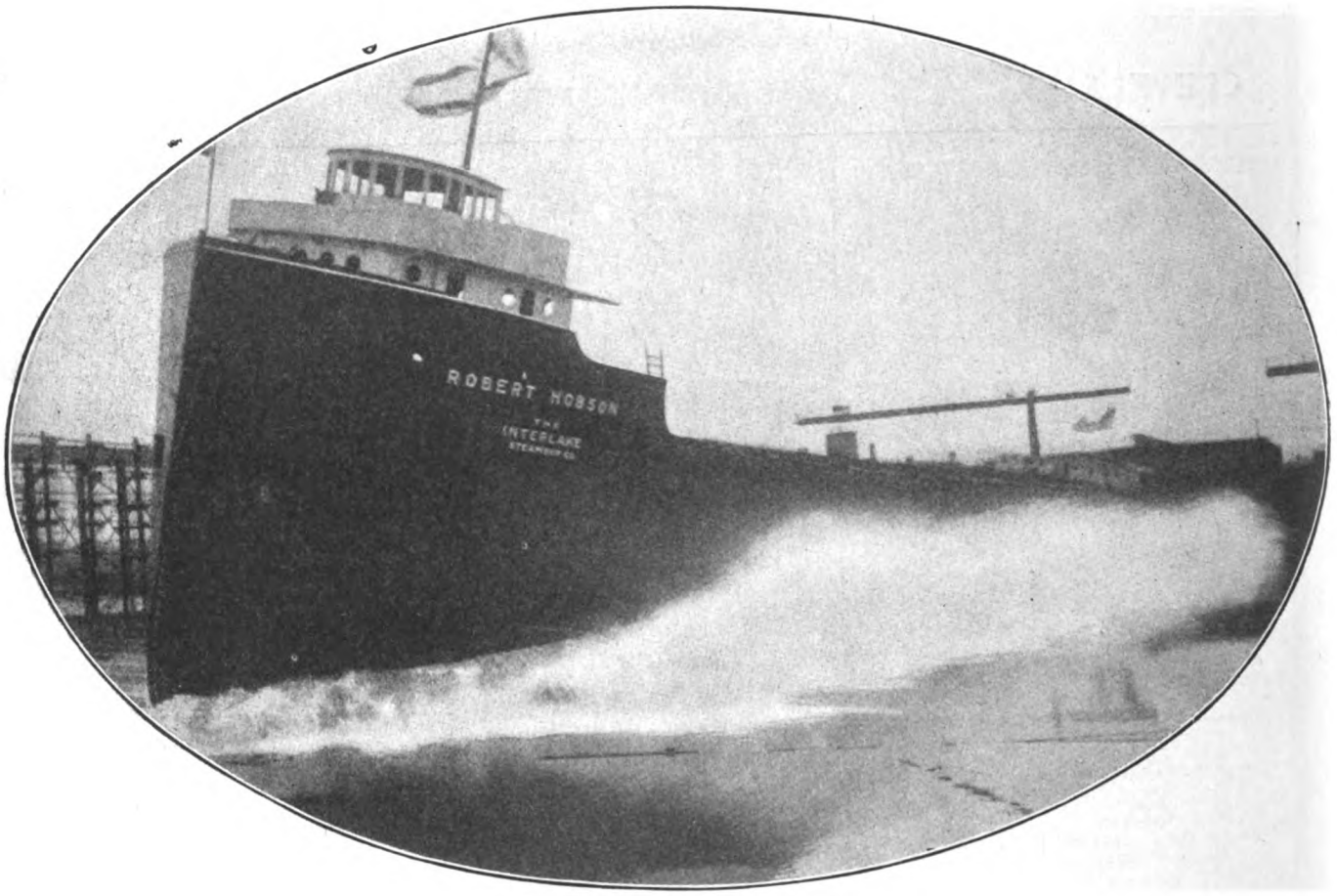
The American Ship



S. S. ROBERT HOBSON

Building for The Interlake Steamship Co.
Launched October 30, 1926

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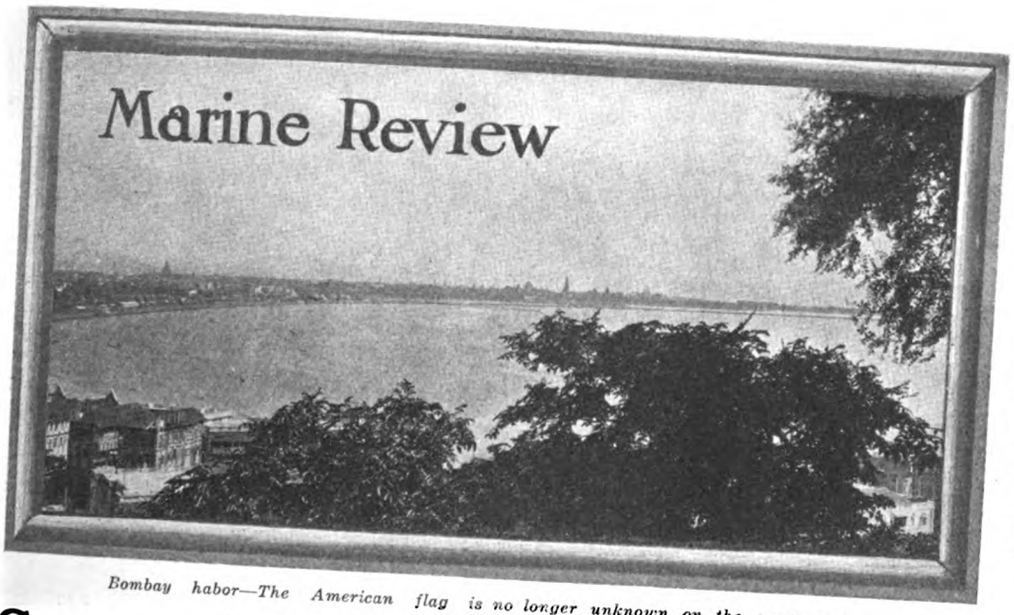


Bombay habor—The American flag is no longer unknown on the seven seas

MANY years ago the American flag was well known in the Far East. Once again it is making a bid for recognition. Two of the accompanying illustrations were taken by a member of the crew of the American steamship Algic maintaining a regu'ar service between the United States and East Indian ports.

Seven Year Record of S. S. Algic

Has Logged 350,000 Miles in Service to India—Never Has Laid Up—Low Repairs—Machinery Is in Good Condition

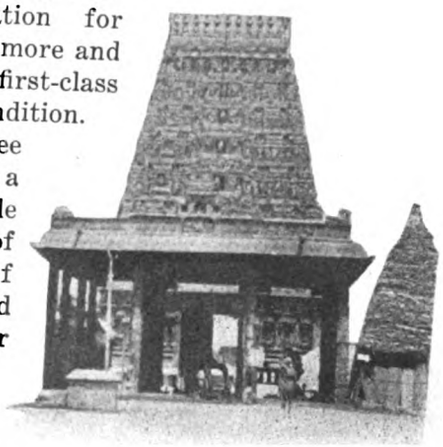
By A. H. Jansson

THE S. S. ALGIC, shipping board freighter built by the Merchant Shipbuilding Co. at Bristol, Pa., delivered in August, 1920, was placed in service September, 1920 and has never missed a sailing in the India trade since that time. On the last voyage completed at New York, Jan. 2, 1927 the ALGIC made a record trip outward bound to Karachi of thirty-two days, cutting four days off the usual time. She has been on every honor roll (five in all) issued by the shipping board.

In seven years of service she has never had a breakdown of machinery and the maintenance cost has been negligible though some improvements to the machinery have been added in the past two years. Approximately 350,000 miles have been logged and the main reduction gears show no appreciable wear and on careful inspection appear practically the same as new. Bridge gage readings on the turbines and leads of all bearings, taken at the end of each voyage, have shown, year in and year out, that there is no measureable wear. The chief engineer states that in all the seven years of operation not a single tube has had to be replaced in any one of her three water tube boilers. Such in brief is the record of one of the American emergency vessels built as a result of the war. And essentially comparable records have been made by other vessels of the same type.

G. M. GUSTAVSON
Chief Engineer S. S. ALGIC

Time enough has now elapsed to enable the unbiased observer to formulate a truer estimate of the mechanical performance of vessels built during and shortly after the war. It is an old story that miracles of shipbuilding were performed in America at that time. It is just as old a story and one that has been even more widely repeated that the ships built at that time under such difficult conditions and in so short a time were so poorly constructed and equipped that they fell down badly in operation. From personal observations this opinion is far from justified. Many of these ships have been in continuous operation for seven years or more and are today in first-class running condition. Nearly three years ago a study was made of the records of performance of the Hog Island type of freighter choosing one as representative of her class of 110.



HINDU TEMPLE AT MADRAS, INDIA

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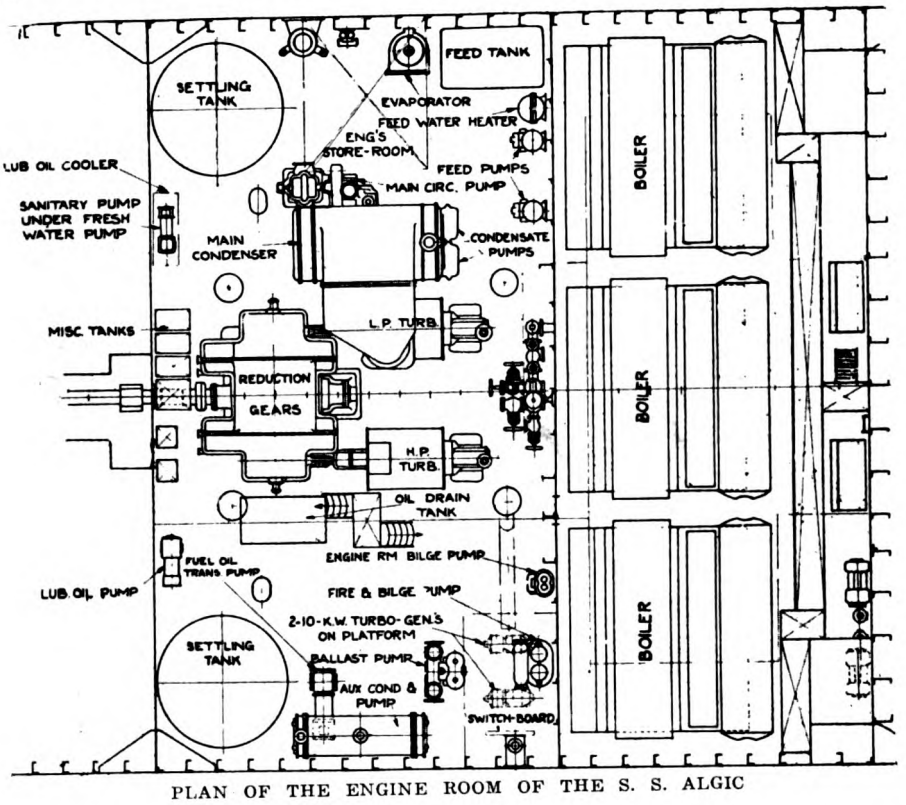


PLAN OF THE ENGINE ROOM OF THE S. S. ALGIC

The results were published in the December 1923 issue of MARINE REVIEW under the heading "Four Year Log of a War Built Ship" and showed that this emergency built freighter then a little over four years old had had regular steady employment and had given efficient service comparable with that of any foreign merchant ship.

The present article is intended to review in a similar manner the service record of the S. S. ALGIC, one of the class of freighters known as the "Merchant type." Nine of this type are now in operation. The accompanying illustrations taken early in January after completion of the fourteenth voyage show her present excellent condition while the accompanying plans and tables give detailed particulars of hull and machinery for the entire class.

A personal inspection of the S. S.

TABLE I

Particulars—S. S. Algic

Hull

Length overall	ft. ins.	417- 8
Length B. P. P.	ft. ins.	401- 0
Beam molded	ft. ins.	54- 0
Depth molded at side to upper deck,	ft. ins.	32-10
Draft, designed, light,	ft. ins.	7- 8
Draft, designed, loaded,	ft. ins.	25- 2
Block coefficient		.79
Displacement, light,	tons	3403
Displacement, loaded,	tons	12,225
Deadweight, in tons at mean load-draft		8822
Gross tonnage, U. S.		5496
Net tonnage, U. S.		3373
Capacity, cargo, cubic feet		476,205
Capacity, drinking water in tons		25.7
Capacity, reserve feed water in tons		137
Steaming radius, in nautical miles		7400
Speed, normal in service with average sea conditions and dirty bottom	knots	9.9

Class—American Bur. and Lloyds.

Machinery

Maine Engine—One Westinghouse impulse-reaction cross compound type consisting of a high pressure and a low pressure unit each connected to a first reduction pinion through flexible shaft and coupling—Total shaft horsepower 3000. Steam pressure at turbine inlet in lbs. per sq. inch gage, 185—Superheat, degrees Fahr. 50—Water rate exclusive of auxiliaries, in pounds per S. H. P. per hour, 11.25 Vacuum, referred to 30-inch barometer in inches of mercury, 28—Reversing power in shaft horsepower, 1800.

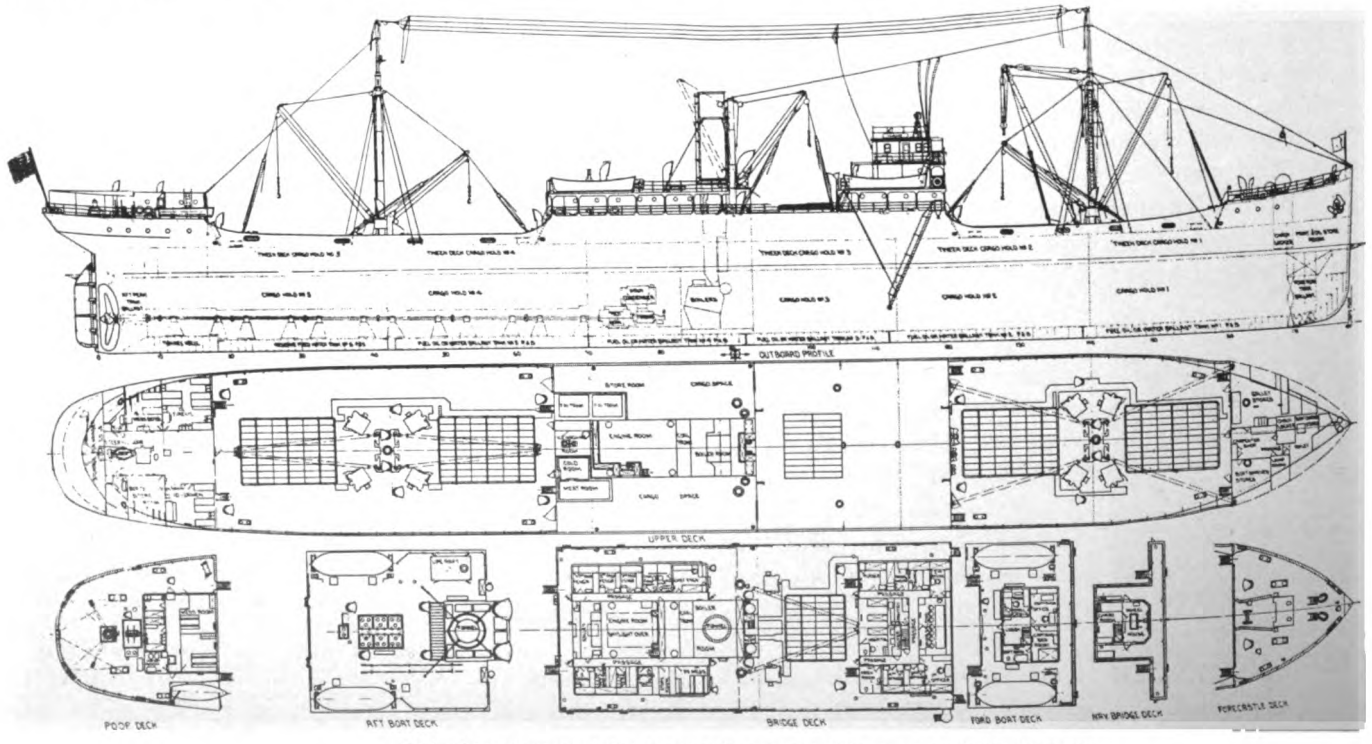
Gearing—Double reduction gear of Westinghouse flexible frame type—pinions and gears double helical with standard involute teeth—Reduction in revolutions per minute from turbine to propeller shaft 3360-90.

Boilers—Three Babcock & Wilcox water tube marine type of 2900 square feet heating surface each, oil burning, with Schutte & Koerting burners—Foster superheaters in each boiler with 290 square feet of heating surface—Induced draft system with Sturtevant fan.

Auxiliaries—Main and auxiliary condenser of 4000 and 800 square feet respectively—Main circulating pump unit of 4000 G.P.M.—Two condensate pump units of 6000 G. P. M. each—Two air ejectors, size E—All of Westinghouse make.

Line shaft, bearings and stern tube supplied by Westinghouse—Each length of shafting is supported by two ring oiled bearings 18 inches long.

Thrust Bearing—Of Kingsbury type.



General Arrangement of the "Merchant" Type Ship, 9000 Tons Dead-Weight Capacity

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S. S. ALGIC AT PIER 4 ATLANTIC TIDEWATER TERMINAL, BROOKLYN, N. Y., JAN. 6, 1927—OPERATED IN THE INDIA SERVICE

TABLE II

Auxiliaries on the S. S. Algic

Below Deck

Generators—Two General Electric, of 15 kilowatts each with reciprocating engines, 8 x 6 inches vertical.

Pumps, Water—Two boiler feed pumps, 12 x 8 x 24 inches, vertical simplex. One bilge pump, 6 x 5¾ x 6 inches vertical duplex. One fire and bilge pump, 10 x 8½ x 12 inches, vertical duplex. One ballast pump, 10 x 12 x 12 inches, horizontal duplex. One evaporator pump, 4½ x 4 x 4 inches horizontal duplex. All of the above pumps of National Transit make. One fresh water pump, 4½ x 3¾ x 4 inches, horizontal duplex. One sanitary pump, 6 x 5¾ x 6 inches, horizontal duplex. One lubricating oil cooling water pump, 7½ x 7 x 10 inches vertical duplex. All three of Worthington make. One combined auxiliary air and circulating pump of Dean make.

Pumps, Oil—Two lubricating oil pumps, 7½ x 7 x 10 inches vertical duplex of Worthington make. Two fuel oil pumps, 5¼ x 3½ x 5 inches, horizontal duplex. One fuel oil transfer pump, 7½ x 7½ x 10 inches, horizontal duplex. The above three of National Transit make.

Oil Coolers—Two of 300 square feet of Griscom Russel make.

Below Deck

Oil Strainer—One 4-inch duplex by Schutte & Koerting.

Oil Filter—One No. 75 by Richardson Phoenix.

Refrigerating Machine—One Frick of one ton capacity.

Evaporator—One by Locomotive Feed Water Heater Co.

Distiller—One Griscom Russel.

Feed Heater—One by Locomotive Feed Water Heater Co.

Deck Auxiliaries

Windlass—One, 10 x 10 inches made by the Weland Co.

Capstan—One, 8 x 8 inches, Hyde Windlass Co.

Winches—Eight, 9 x 9 inches, Clay Machine Co.

Winches—Two, 8¼ x 8 inches, Lidgerwood.

Steering Gear—Williamson screw type, American Engineering Co., size 9 x 9 inches.

Wireless—Two kilowatts of Lowenstein navy type.

Search Light—One of 8000 candle power, with 18-inch lens, Carlisle & Finch.

TABLE III

Machinery Weights S. S. Algic

All in Pounds

Main high pressure turbine	13,520
Main low pressure turbine	17,270
Main reduction gear	63,800
Main steam strainer, 6-inch	350
Maneuvering valves, 6-inch	1,310
Cross-connecting piping and valves including those for control of emergency live steam	9,000
Main exhaust trunk	12,000
Main expansion joint	120
Main condenser	29,600
Circulating pump unit	6,270
Two condensate pumps	2,040
Two air ejectors	180
Air separator	780
Aux. condenser without pumps	7,250
Six lengths of line shafting and tail shaft	82,000
Twelve line shaft bearings	13,680
Stern tube	7,200
Total, in pounds	266,370
Total, in tons	**118.9**

ALGIC on Feb. 5, while she was lying at anchor in New York harbor completely substantiated the good reports. Outside hull, on deck, in quarters, in engine room and boiler room cleanliness and good order prevailed and practically no signs of deterioration were noted. In other words it is apparent that this vessel has received excellent care and attention from her crew and her operators. For several years the ALGIC was under the operation of the Kerr Steamship Co. She is now under operation by the Roosevelt Steamship Co. as operators for the United States shipping board and runs in what is called the Atlantic, American India and Australian lines. Kermit Roosevelt is president of the company. Six ships including the ALGIC are operated by the Roosevelt Steamship Co. to India for the United States shipping board. Beside New York and Philadelphia as occasion warrants calls are made by ships

ENGINE ROOM OF THE S. S. ALGIC—JAN. 6, 1927—STARBOARD SIDE LOOKING INBOARD—CHIEF ENGINEER AT CONTROL PLATFORM TO THE RIGHT

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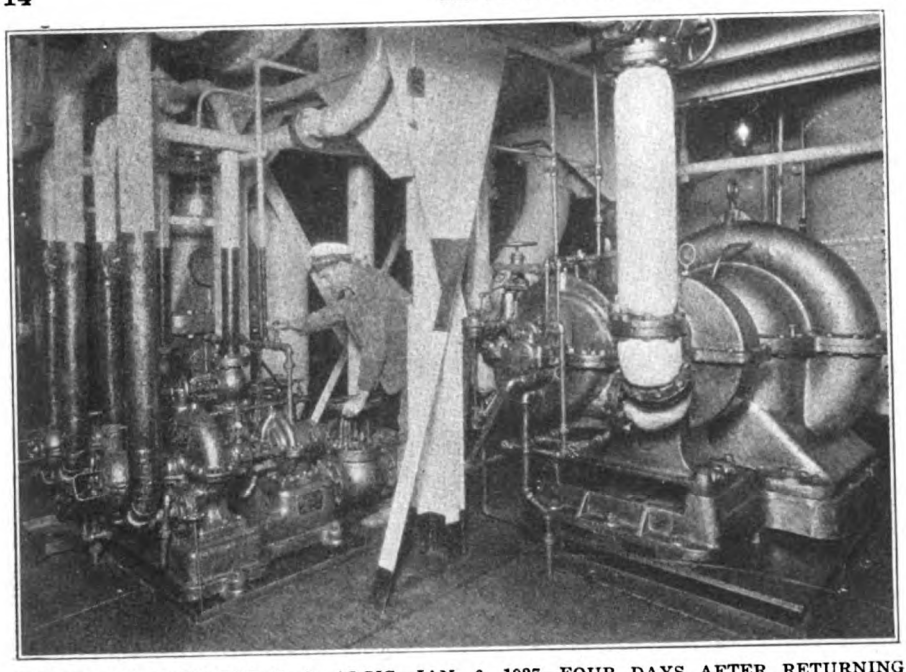

ENGINE ROOM OF THE S. S. ALGIC—JAN. 6, 1927—FOUR DAYS AFTER RETURNING FROM A FIVE MONTHS VOYAGE TO THE FAR EAST—FIRST ASSISTANT ENGINEER AT CONDENSATE PUMP NO. 2

TABLE IV

Wages on S. S. Algic—Shipping Board Scale

Deck Department	Per Month
1—Captain	2 0 00
1—Chief officer	185 00
1—Second officer	165 00
1—Third officer	150 00
1—Radio operator	105 00
1—Boatswain	75 00
8 Able seamen at $62.50	500 00
2—Ordinary seamen at $47.50	95 00
1—steward	120 00
2—Cooks	180 00
3 Messboys at $42.00	126 00
22—Total in deck department	$1991.00

Engine Department	Per Month
1—Chief engineer	260 00
1—First assistant engineer	185 00
1—Second assistant engineer	165 00
1—Third assistant engineer	150 00
3—Oilers at $72.50	217.50
3—Watertenders at $72.50	217.50
2—Wipers at $57.50	115.00
3—Firemen at $65.00	195.00
15—Total in engine room crew	$1505.00

Total—Officers and crew on S.S. Algic—37
Total wages per month $3496.00.

of this line at Baltimore, Norfolk, Boston and St. John, N. B. Seven ships are also operated by the same company for the shipping board to Australia via the Panama canal and across the Pacific. Recently these ships have been routed so that the return trip will be via India and Suez canal.

Two round voyages a year is the schedule called for in the India service. The itinerary after leaving New York is as follows: Port Said; Suez; Aden, Arabia; Karachi, India; Bombay; Colombo, Ceylon; Madras; Calcutta; Coconada; then homeward bound, Bombay; Karachi; Suez; Port Said; New York and Philadelphia and sometimes to Baltimore, Norfolk, Boston and St. Johns, N. B. Fuel oil enough is put on board in New York to carry the vessel with proper margin of safety to Aden, Arabia on the outward trip, where enough fuel oil is taken on to complete all calls at Indian ports and return through the Suez canal to Port Said where sufficient fuel is again put on to complete the voyage to New York. Considerable saving in canal dues is made by this procedure, in that the double bottom tanks are empty when passing through the canal.

Cargo taken out from the United States is of miscellaneous manufactured products. For instance, such as automobiles, refrigerating and other machinery, chemicals and drygoods. As a rule the vessels in this line sail with full cargo. Cargo is booked for all ports mentioned except Port Said and Suez. When there is any available parcel post to Egypt and India it is also carried. On the return trip the ships of this line are always fully loaded. Chrome ore and copra is loaded at Madras; manganese and bales of burlap and raw jute, at Calcutta; sacks of castor beans from which castor oil is made, at Coconada; miscellaneous products, but mostly Persian rugs, ivory nuts used for making buttons, etc., mirablan nuts used for making dice, and goat skins, at Bombay.

Coconada as a port of call is particularly interesting in that vessels are required to anchor in the open sea approximately ten miles off the port. All cargo is handled from lighters which come out to the ship. These lighters are small sail boats manned by Chinese coolies who also act as stevedores, operate the winches, and take over the entire business of cargo handling. Approximately 150 of them are used for each ship. They bring their own food which is fish and rice and prepare it themselves on deck and sleep on deck. In bad weather the ship may be held up a number of days as the lighters can not come close. It is even necessary sometimes for the ship to go further out to sea and keep under way to weather the storm. The coolie longshoremen are paid the equivalent of 13 cents a day.

Direct responsibility for the upkeep of the shipping board vessels allocated to the Roosevelt Steamship Co. rests on Paul R. Smith marine superintendent. For good results it is necessary to depend upon the officers of the ship. The excellent rec-

(*Continued on Page* 40)

TABLE V

S. S. Algic—Summary of Voyage Reports

(Performances were not recorded in this manner for voyages prior to Voyage No. 9)

Voyage No.	9	10	11	12	13	14
Dates Out	3/5/24	9/25/24	2/10/25	8/26/25	1/16/26	7/10/26
Dates Return	8/14/24	2/2/25	7/20/25	1/6/26	6/30/26	1/2/27
Obs. miles	20408	21271	20656	22907	21730	22013
Hours in port	1543.6	1388.1	1602.4	1469.2	1817.4	2062.7
Bbls. fuel total in port	....	1394	2439	1719	2630	2295
Bbls. fuel total for voyage	....	18692	18545	20310	18960	19283
Obs. speed	9.89	9.95	9.33	9.75	10.8	9.76
Wheel knots	11.26	11.14	10.65	10.78	10.94	10.81
Average R. P. M.	84.5	83.7	80.0	80.9	82.1	81.1
Fuel 24 hrs. at sea bbls.	28.47*	181.5	159.1	175.7	166.4	172.4
In port bbls.	5.96*	24.15	36.51	28.07	34.73	26.72
Lbs. fuel, obs. miles	269.2	256.0	240.0	253.6	232.4	248.7
Sea eff. per cent	96.2	101.0	98.6	108.1	111.4	110.9
Port eff. per cent	62.0	88.0	95.0	92.8	81.5	86.6
Weather rough per cent	38.6	36.0	41.3	25.0	16.0	22.3

* In tons for this voyage.

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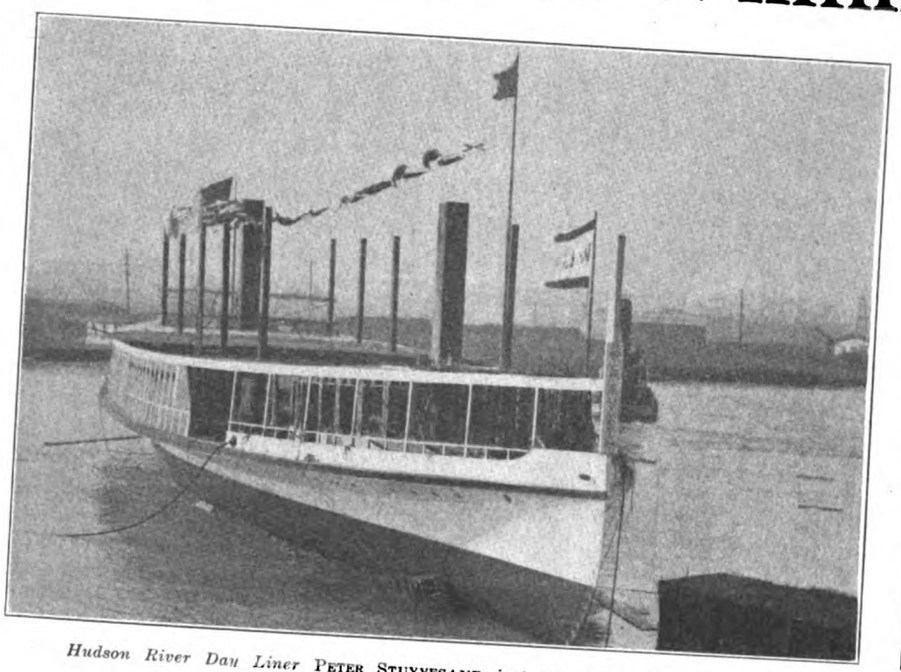
Launch New Hudson River Day Liner at Wilmington



Hudson River Day Liner PETER STUYVESANT *just after launching Feb. 2, 1927*

THE launching of a new Hudson River Day Line steamer embodying many advanced features in steamboat construction took place Feb. 2, at the shipyard of Pusey & Jones, Wilmington, Del. J. W. Millard & Bro. New York are the naval architects.

The steamer, PETER STUYVESANT, named in honor of the most famous governor of the Dutch colony of New Amsterdam, now New York, will be commissioned at the beginning of the summer excursion season. Miss Katherine Olcott, daughter of E. E. Olcott, president of the Day Line, and a granddaughter of Commodore Alfred Van Santvoord, founder of the company acted as sponsor. A special party of guests from New York attended the launching followed by a luncheon at the Hotel Du Pont.

The PETER STUYVESANT is 268 feet long with a beam of 60 feet, and will draw 12½ feet of water. She has a hull and main deck of steel with three joiner decks above. There is a steel lower deck forward and aft of the boiler and machinery space.

Differing from other steamers of her class now in operation in the waters in the vicinity of New York the enclosed spaces on the third deck of the PETER STUYVESANT will be eighteen inches higher than the level of the corresponding outer deck. This structural innovation will give to passengers who are seated in the enclosed spaces an unusually clear and unobstructed view over the heads of those who may be seated on the outer deck, and will add greatly to the enjoyment of the trip. The entire enclosure of the second deck will be of plate glass doors and windows giving to a far greater number of passengers the advantages of uninterrupted views of the Hudson and the picturesque scenery along its shores. The carpeted saloon, eight private parlors and the writing room will be on the third deck instead of on the second as in the case of other Day Line steamers now in

(*Cont. on P.* 46)

LAUNCHING OF THE PETER STUYVESANT AT PUSEY & JONES, WILMINGTON, DEL. —MISS KATHERINE OLCOTT, SPONSOR, AND HER FATHER E. E. OLCOTT, PRESIDENT OF THE HUDSON RIVER DAY LINE—AT EXTREME RIGHT—A. V. S. OLCOTT, GENERAL MANAGER OF THE LINE

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Use Oil Engine Electric Drive

Latest New York Central Harbor Tug Is Equipped with Two Oil Engine Generating Sets and One Electric Motor Driving Propeller

EQUIPPED with Ingersoll-Rand engines, the most powerful oil-electric tugboat in the world has been placed in service in New York harbor by the New York Central railroad, where it is now being used for towing barges and carfloats. Following official tests, the new tugboat, known as NEW YORK CENTRAL LINES No. 34 made a number of short cruises in the harbor on Jan. 26. The cruises were attended by representatives of the federal and city governments and many prominent officials of railroad, tugboat and oil companies, as guests of the New York Central lines and the Ingersoll-Rand Co.

Eight outstanding advantages of this type of tugboat were pointed out by Frederick W. O'Neil, chief engineer of the Ingersoll-Rand Co. in an interview. These are: bridge control, constant full-load power, excellent torque performance, economical generation of power, decreased engine weight, power reserves, savings in service time and reduced operating costs.

"From the bridge positive and accurate control of the boat is made possible," said Mr. O'Neil. "Control signals to the engine room are eliminated. By bridge control of the tugboat a saving in time in landing, and in maneuvering through restricted waters is effected. The tugboat is easier to handle and more responsive than an automobile. By bridge control the possibility of damage to docks, to the tugboat itself and to other craft is practically eliminated. Rope breakage is reduced to a minimum through the pilot's ability to gradually take up the strain in the rope under direct observation.

"If the engine and propeller are directly connected, the engine when driving the boat without a tow runs at a certain speed taking the full power of the engine and drives the tug, say 10 or 12 miles per hour. When the tug is fastened to a tow it will obviously run slower, say 5 or 6 miles per hour, depending the size of the tow. In this case it is not possible to drive the propeller at the high speed used when the ship was free. A lower propeller and engine speed must be used to correspond to the lower speed of the ship. This means a reduction of horse power, that is, the full power of the engine is not available. This is the condition when the vessel should be doing its most effective work. In the oil-electric, however, the engines run at a constant speed, driving the generator so that the generator can always put out the full power of the oil engines. When the propeller is turning slowly for towing, the electrical hook-up is such that the power given the propeller can be made correspondingly larger as the speed is less so that in effect the propeller can push as much horsepower while towing as when running at high speed without a tow.

"Excellent torque performance is given by the oil-electric tugboats. The electrical machinery of the tug is able to develop large overloads for short periods of time. This permits heavy torque overloads at reduced propeller revolutions per minute, without exceeding the engine rating, since the engines operate at constant speed. The developed engine horsepower can be constant, irrespective of the propeller speed.

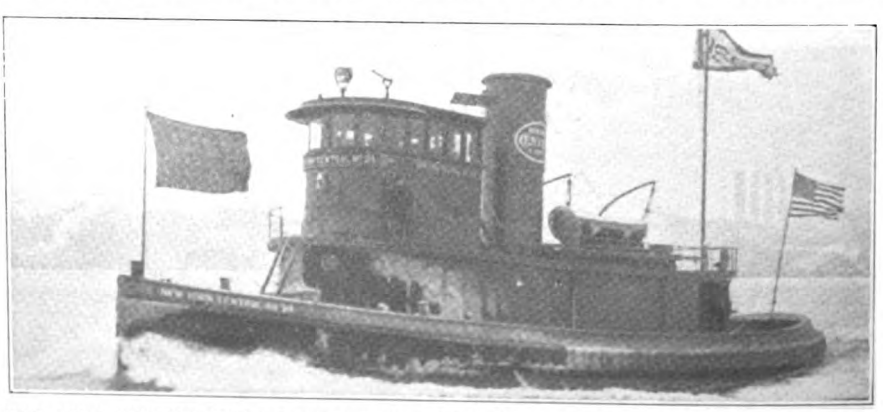
"The proper speed for a propeller is a function of the size and type of the ship. In the oil-electric drive the propeller can be run at any speed to suit the ship for it need not be run at the same speed as the engines. The engines therefore can be a high speed type used for generating power, which makes them lighter and more efficient. In other words, one can have the proper propeller for the ship and the proper engine for the most economical generation of power. When the engine is directly connected a compromise is made between the most desirable propeller for speed and the proper engine speed. This results in the selection of an engine whose speed is comparatively slow and which makes it large in size and weight. The oil-electric type with an electrical hook-up between the propeller and the oil engines is like a set of gears which have an infinite number of speed reductions.

"The weight of the oil engines of the oil-electric tugboat is less than the power plant needed for securing the same power in a steam tugboat. The space occupied by oil-engines is less. And, in addition, smoke is eliminated; there are no ashes or boilers, and tanks for fresh water are eliminated.

"There is a reserve of power in the oil-electric tugboat. There is considerably less danger of complete paralysis of the tug. With one of its two oil engines

Electric Drive for Tugs

There is never likely to be complete agreement even among thoroughly reasonable, experienced and informed engineers in regard to the choice of motive power for any type of craft. But all qualified engineers will agree that the requirements of different services must be taken into account with impartiality. These requirements are well known for a harbor tug boat. The obvious outstanding advantages of oil electric motive power for this type of vessel over either direct-connected diesel or steam are: complete and instantaneous bridge control; ability at all times and at once to vary the power delivered to the propeller through its complete range; and the important feature of maximum horsepower at the propeller over a reasonable variation in shaft revolutions, which means, the same power at considerably less than maximum revolutions.



NEW OIL-ELECTRIC TUG PLACED IN SERVICE IN NEW YORK HARBOR IN JANUARY

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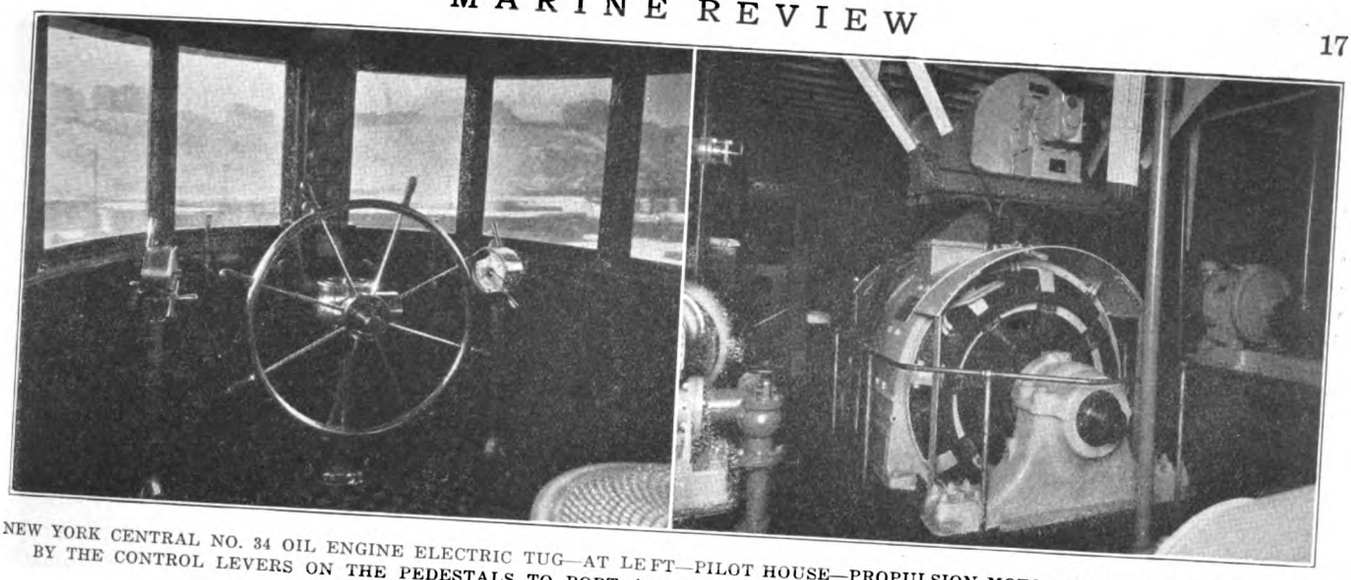


NEW YORK CENTRAL NO. 34 OIL ENGINE ELECTRIC TUG—AT LEFT—PILOT HOUSE—PROPULSION MOTOR IS OPERATED DIRECTLY BY THE CONTROL LEVERS ON THE PEDESTALS TO PORT AND STARBOARD—AT RIGHT—DOUBLE ARMATURE PROPULSION MOTOR OF 650 SHAFT HORSEPOWER

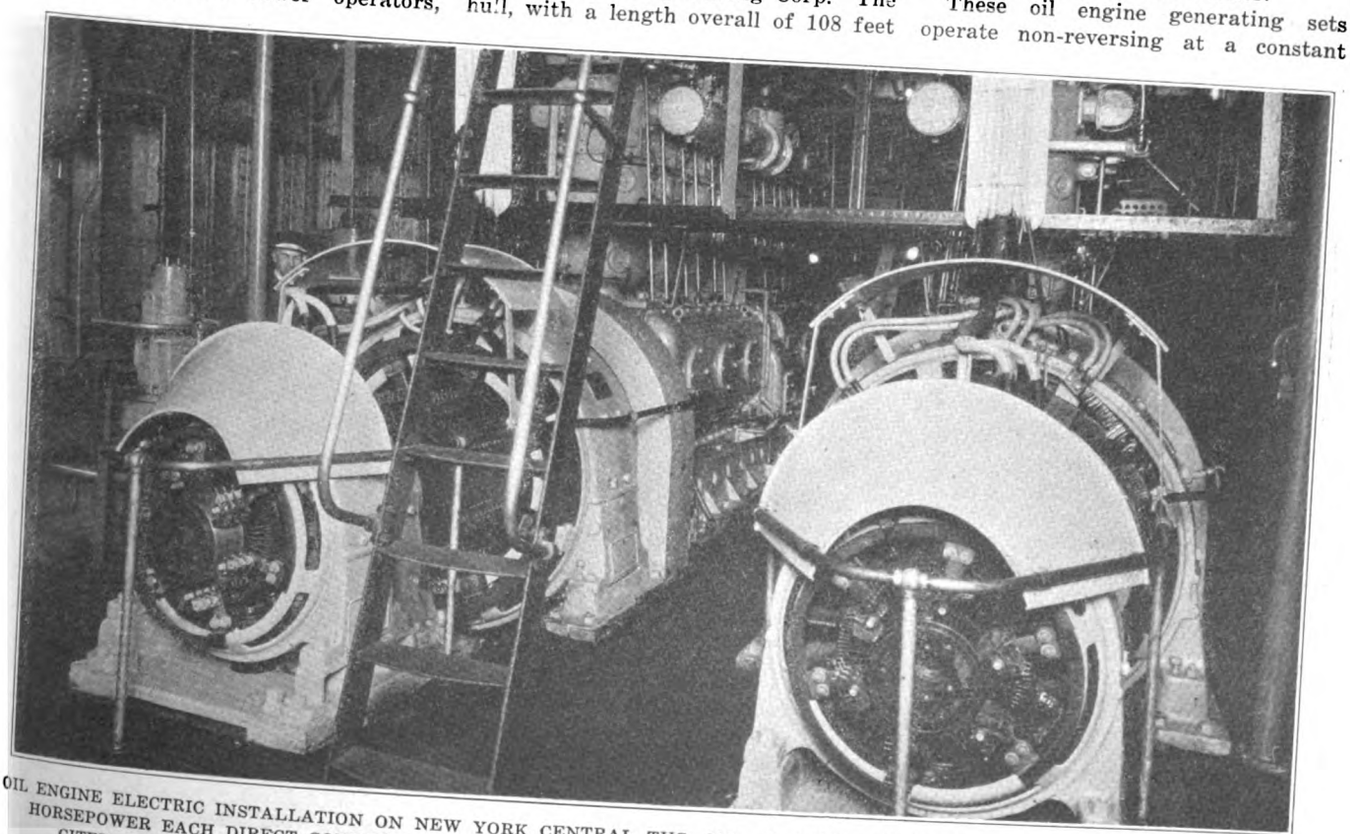
operating, approximately 80 per cent of the full speed of the tug is possible.

"Due to time saved in fueling and in the elimination of the need for disposing of ashes and cleaning boilers, in the saving of time necessary to get up steam and in its ability to start and stop immediately, the oil-electric tug is in service a greater part of the time than is the case with the steam tug.

"Because of its reduction of fuel costs, of its ability to be in service more frequently than the steam tug and the need for fewer operators, it has been estimated that the yearly operating expense, including all charges on the investment, is approximately 20 per cent lower than for a steam tug of the same power. It has been estimated that this saving will in 2½ to 3 years make up for the higher initial cost of the oil-electric as compared with the initial cost of the steam tug."

NEW YORK CENTRAL LINES NO. 34 was designed by J. W. Millard and Bro., and built and outfitted by the Staten Island Shipbuilding Corp. The hull, with a length overall of 108 feet 3¼ inches, a 20-foot beam, and depth of 13 feet 3 inches and a draft of 9 feet, was launched on Oct. 15, 1926. Miss Jennie M. Hutter of the New York Central lines marine department acted as sponsor. The oil-electric power of the boat consists of two Ingersoll-Rand type PR, 6-cylinder 4-cycle, solid injection, 14-inch diameter by 19-inch stroke, oil engines, each direct connected to a 270-kilowatt. General Electric compound wound generator and 30-kilowatt exciter.

These oil engine generating sets operate non-reversing at a constant



OIL ENGINE ELECTRIC INSTALLATION ON NEW YORK CENTRAL TUG NO. 34—TWO INGERSOLL-RAND OIL ENGINES OF 400 HORSEPOWER EACH DIRECT CONNECTED TO A 270-KILOWATT GENERAL ELECTRIC GENERATOR AND 30-KILOWATT EXCITER—THE GENERATORS SUPPLY POWER FOR ONE 650 SHAFT HORSEPOWER MOTOR—THE EXCITERS FURNISH POWER FOR ELECTRIC AUXILIARIES AND FOR EXCITATION FOR MAIN MOTOR

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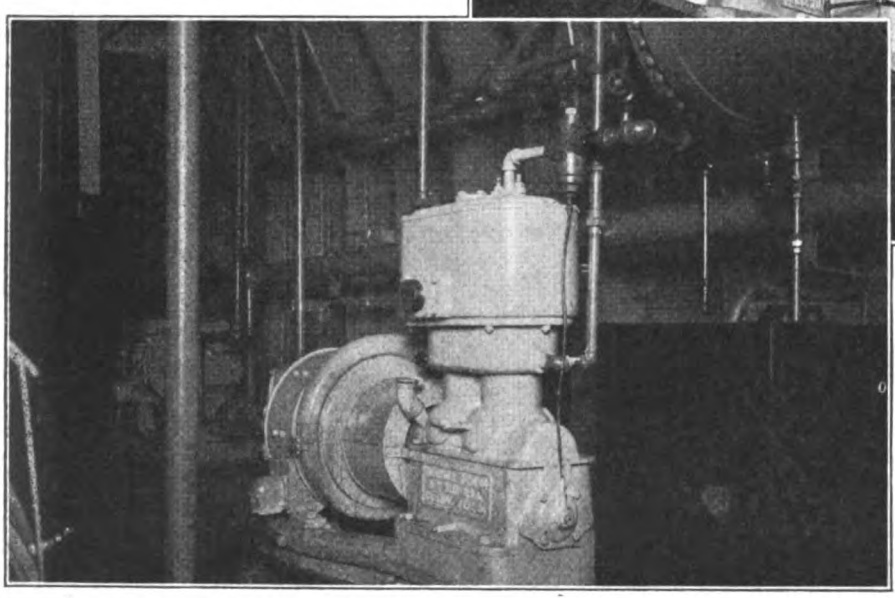
speed of 265 revolutions per minute. The generators are connected in series and normally supply 480-volt direct current for the 650 shaft horsepower double armature, shunt wound propulsion motor. The motor is direct connected to the propeller shaft and is capable of delivering full power of 650 shaft horsepower at any speed from 115 to 145 revolution per minute.

This tug is said to provide the utmost economy of operation, approximately, 25 gallons of fuel oil being required to drive the tug for one hour. Officials of the Ingersoll-Rand Co. pointed out the fact that with the craft's propulsion machinery, it is possible to operate either one or both of the generating sets, thus providing utmost flexibility in operation.

Another novel feature of the tugboat's construction is its control, which at all times is entirely in the hands of the captain in the pilot house. The boat, designed particularly for ease of handling in congested waterways, can turn around in its own length. while in pulling power it is



NEW YORK CENTRAL NO. 34 OIL ELECTRIC TUG—INGERSOLL-RAND AIR COMPRESSOR 6¼ X 2¾ X 5 INCHES DIRECT CONNECTED TO 12-HORSEPOWER MOTOR

said to set a new mark in tugboat service.

Full motor-driven auxiliary equipment is carried, including a powerful fire fighting pump operating three nozzles. Power for this pump can be diverted at will from either of the propulsion motor armatures, the other being used to keep the tug in motion.

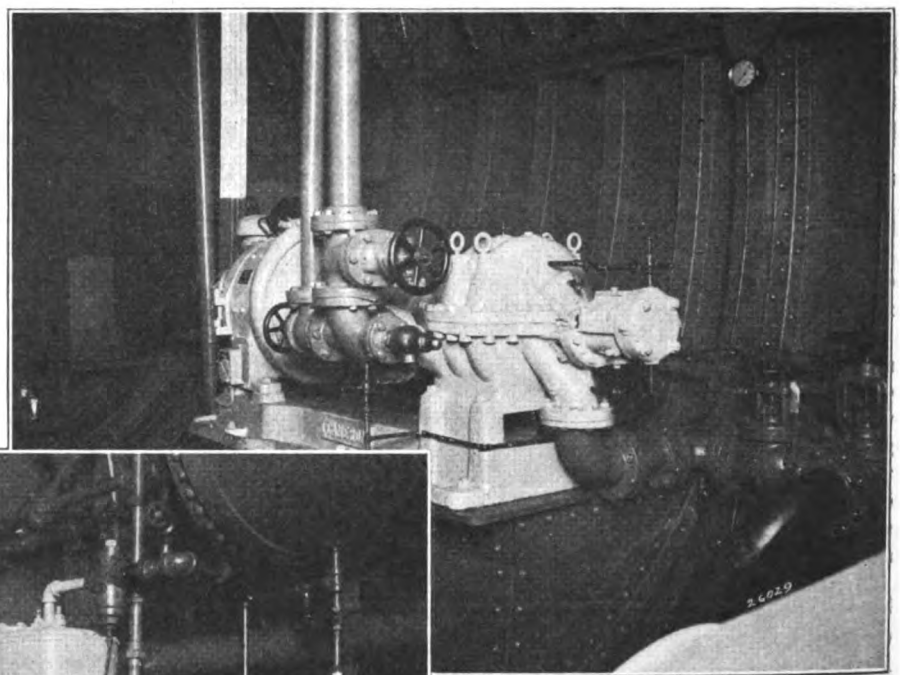
A 6-horsepower Hill diesel engine, driving a 4-kilowatt, 120-volt direct current generator, supplies power and light for stand-by service. The auxiliary generating set is also connected through a clutch to an Ingersoll-Rand type 15, 4½ x 5-inch air compressor, which charges the air tank when no other power is available to start the main engines. An Ingersoll-Rand type 20 compressor, driven by a 12-horsepower motor, charges the main air tanks from which the main engines are started.

A Cameron multi-stage centrifugal pump with a capacity of 500 gallons per minute against 150 pounds discharge pressure is driven at 1700 revolutions per minute by a 75-horsepower motor. This is the pump that supplies water to three nozzles included in the fire-fighting apparatus.

A service pump of the Northern type, 250-500 gallons per minute against 30 pounds head is motor-driven at 575-1150 revolutions per minute through herringbone reduction gears. This unit is run at the minimum revolutions per minute for pumping bilges. It can be used for pumping water out of barges at the maximum capacity.

Two circulating water and bilge pumps, Northern rotary type, are driven by 5-horsepower motors. These units have capacities of 175 gallons per minute against 30 pounds pressure. A fuel oil transfer pump, Northern rotary type, is driven by a 2-horsepower motor. The steering motor 1½ horsepower, 115-volt, operates a Hyde electric steering gear at 550 revolutions per minute.

An American Radiator oil burning furnace is used for heating the pilot house, engine, and crew quarters. Pilot house control levers mounted on Cory pedestals, are located at either



CAMERON FIRE PUMP 500 GALLONS PER MINUTE AGAINST 150 POUNDS PRESSURE —75-HORSEPOWER GENERAL ELECTRIC MOTOR AT 1700 REVOLUTIONS PER MIN.

side in the pilot house. One lever controls the revolutions per minute of the propulsion motor and the other the direction of rotation.

Except for size, the NEW YORK CENTRAL No. 34 is the same in exterior appearance as other tugs of the fleet. The stack, which is not required, has been retained for housing the exhaust pipes of the engines and for ventilating the engine room.

Get Conversion Bids

Bids to convert the last three shipping board steamers in the dieselization program of the shipping board which calls for 12 in all, were received Feb. 15, by the maintenance and repair division of the Fleet Corp., New York. The bids were as follows:

Bethlehem Shipbuilding Corp. to install the McIntosh and Seymour double acting engine in the WEST GRAMA, $575,000; Morse Drydock & Repair Co., installation of Hooven,

(*Continued on Page* 58)

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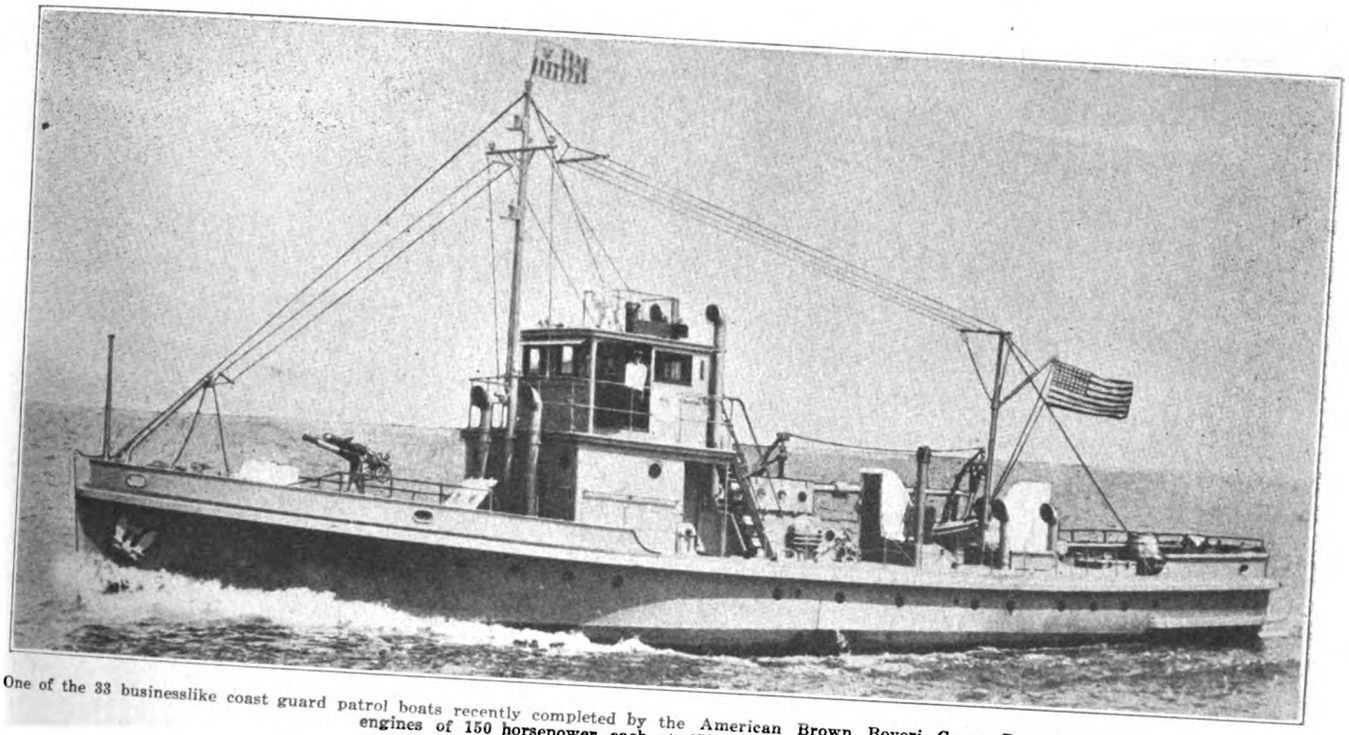


One of the 33 businesslike coast guard patrol boats recently completed by the American Brown Boveri Corp.—Propelled by twin Winton diesel engines of 150 horsepower each at 450 revolutions per minute

Build Sturdy Coast Guard Boats

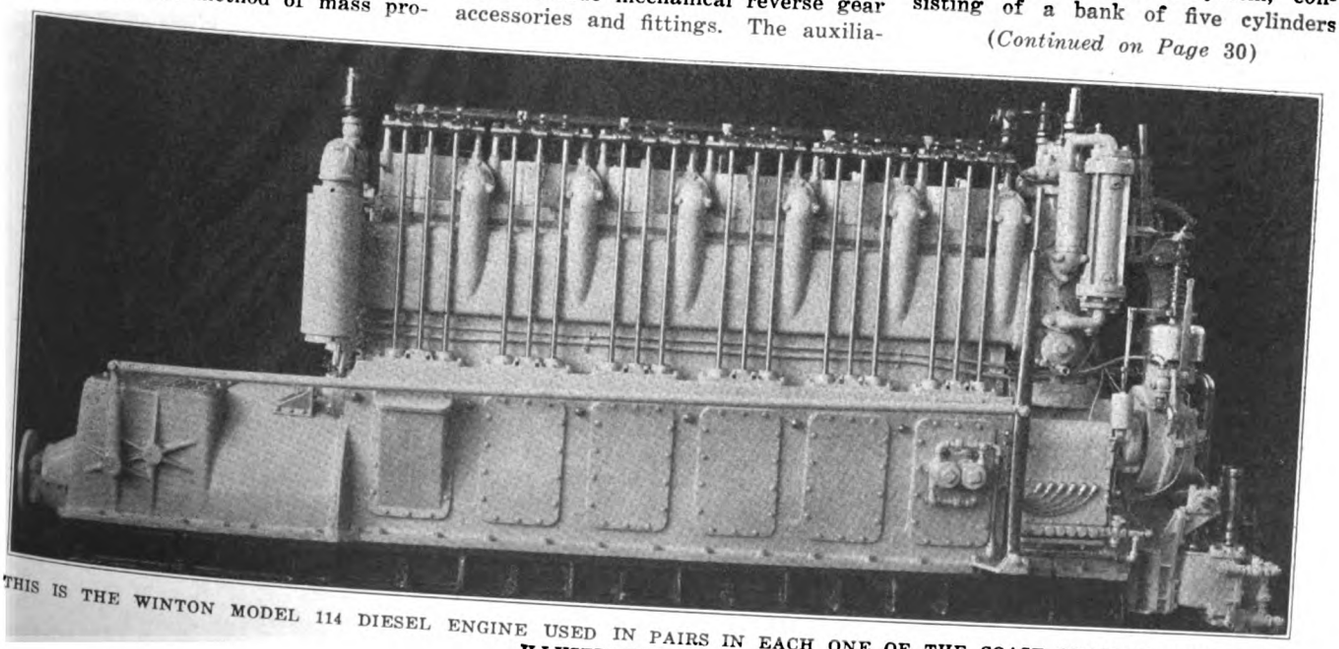
THE new coast guard patrol boats, thirty-three in all, are trim, sturdy, well proportioned little vessels designed and built to stand heavy weather and hard service. They are larger and faster than any other diesel patrol boats now in service. Each vessel is engined with a pair of model 114 Winton diesel engines, each rated at 150-horsepower at 450 revolutions per minute, giving a rugged dependable and economical power plant.

The illustration on page 30, of six boats shows the method of mass production adopted by the builders, the American Brown Boveri Electric Corp., to keep down cost and to speed up delivery. The principle particulars of the hull may be tabulated as follows:

Length overall, ft. ins.	125-0
Length, water line, ft. ins.	120-0
Beam, molded, ft. ins.	23-6
Depth, molded, amidship, ft. ins.	12-0
Draft, mean, ft. ins.	6-9
Draft, maximum, ft. ins.	8-6
Displacement full load conditions, in tons, about 200	

The engines are of six cylinders and operate on air injection. The engines include mechanical reverse gear accessories and fittings. The auxiliaries consist of one Winton model 109 motor driven air compressor set for starting purposes; a motor driven fuel oil service pump; a fire pump, direct connected to a 7½-horsepower, 32-volt, direct current motor mounted on a common base; one 8-kilowatt 32-volt diesel engine generator set, hand starting; refrigerating unit consisting of a 13 cubic-foot box and refrigerating machine with motor control and connection; one CO_2 fire extinguishing system, consisting of a bank of five cylinders

(*Continued on Page 30*)



THIS IS THE WINTON MODEL 114 DIESEL ENGINE USED IN PAIRS IN EACH ONE OF THE COAST GUARD PATROL BOATS ILLUSTRATED ABOVE

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Recently completed coal bunkering machine at Port Huron, Mich., near the International tunnel

Bunker Coal Is Weighed at New Port Huron Station

BY A. D. CARLTON

BUNKERING coal burning ships on the seaboard as well as on the Great Lakes except in those instances where the ship is taking on cargo of coal has invariably been accomplished in a crude and primitive manner. The quality and weight has often been somewhat uncertain even under the best conditions and with the sincere desire of all parties concerned to be fair. There has been in other words no check such as is by general consent and recognized custom observed in practically all transactions of modern business.

It may be argued for the existing methods of bunkering that conditions imposed do not make it practicable to employ exact methods. Ships do not find it convenient as a rule to go out of their way to a deep water coal terminal unless their trade takes them to a coal exporting port, as would apply for instance to ships making Hampton Roads or ships engaged to carry coal from Iake Erie ports to upper lake ports.

On the Great Lakes, however, circumstances surrounding bulk cargo movement would seem to permit of improving the customary methods of bunkering. The courses of ships in this trade takes them through land locked and comparatively narrow waterways where without any appreciable deviation and little delay ships requiring bunkers could go alongside of a modern coal dumper conveniently situated on deep water along the shore.

Acting on the belief that a modern coal dumper for bunker coal so situated would fill a real demand and render an efficient service to shipping on the Great Lakes, the Port Huron Coal & Dock Co. recently perfected and erected a new modern machine for putting fuel aboard steamboats. This outfit is located at Port Huron, Mich., on the St. C'air river alongside the international tunnel, convenient to the main highway of commerce of the Great Lakes near the lower end of Lake Huron.

By referring to the accompanying general illustration of the entire dock it will be noted that the machine is placed on the upper end of the property. This was done so that boats fueling will not interfere with the self unloader boat unloading cargo at the lower end of the dock or, so that the boat unloading will not interfere with the boat fueling.

The coal is brought from Lake Erie ports to this coaling station in self unloader boats and placed over a tunnel which runs the full length of the property. The coal is then conveyed by a conveyor belt system within the tunnel to a hopper at the base of the skip hoist; thence by means of the skip buckets into the inclined bins shown in the illustration. There are two bins each with a capacity of about 350 tons giving a storage capacity overhead of approximately 700 tons with a hoisting capacity of about 150 tons per hour. These bins rest on Fairbanks automatic scales so that every pound of coal which is sold for fuel purposes can be accurately weighed.

All operations of the coal dumper

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are accomplished electrically with the exception of the two gates on the front of each bin which are operated by compressed air. However, all controls and operating switches are in the scale house which is built in the structure and in an emergency one man from the scale house can operate the entire equipment

The bins are placed on an angle of 45 degrees to assure good drainage as well as rapid flow of coal and the two openings in each bin will allow quick discharge of coal to the chutes. In laying out the dock and equipment every effort was made to arrange the mechanism so that there would be as little breakage and degradation of the coal as possible. In other words, there is less breakage handling coal from a self unloader boat than with clams and rather than rehandle it with clams from the dock to the bin a belt conveyor system is used. The only place where the coal falls any distance is from the end of the chute into the coal bunker.

The chutes on top of the bins are so arranged that the coal from both buckets will flow into one bin simply by throwing a butterfly gate or if desired the coal can be loaded into both bins at the same time. The chutes have been extended along the top of the bins for two reasons. First, to save breakage of coal when loading the bins and, second, small gates have been fitted in these chutes so that the bin can be filled level to the top without any chance of the coal running over the lower end on the boat and perhaps doing personal injury.

LOOKING DOWN STREAM AT THE NEW MACHINE FOR BUNKERING SHIPS AT PORT HURON, MICH.—THE UPPER STRUCTURE INCLUDING THE CHUTES IS BALANCED ON FAIRBANKS SCALES

Referring to the illustration showing a close-up of the lower end of the skip hoist, it may be noted that this apparatus will work automatically as long as the power is turned on. With the belt in operation the coal comes off the end through a hopper in the small powerhouse and thence into the skip buckets. When the empty skip bucket comes down lugs on the outer side engage a cross bar on the chute which automatically opens it and the coal flows into the bucket. The bucket has a capacity of about two tons and when a given weight is placed in this bucket a trap is automatically thrown in the bottom of the pit which causes the bucket fully loaded to move up the skip while the other bucket which has been emptied is lowered and goes through the same operation.

As previously mentioned all the coal is accurately weighed. (Refer to the illustration of the interior of the scale house.) Each bin, has separate scales, with the weighing beams located in the scale house. The Fairbanks people have designed this double beam arrangement whereby, the lower weight is placed at zero and the

INTERIOR OF SCALE HOUSE SHOWING TWO SETS OF SCALES FOR THE TWO BINS—THE COAL DUMPED IS WEIGHED ON THE LOWER BEAM OF EACH SCALES—WEIGHT TICKET PUNCHED WHEN SCALES BALANCE SHOWS EXACT WEIGHT

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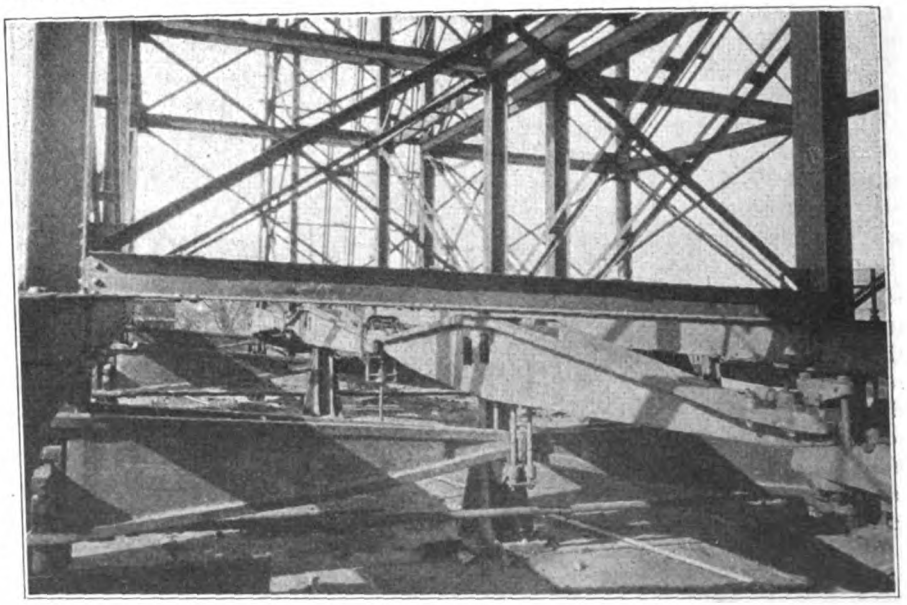
coal in the bins is weighed on the upper beam. If for example the captain desires 150 tons, the lower weight is placed at the designated amount. Then the chutes, are lowered, the gates opened, and when the approximate amount required has left the bin or, in other words, gone into the bunker, the beam will begin to waver. Then the gates are closed, the lower beam is balanced to the exact weight, the weight ticket is inserted and the actual weight which left the bin and went into the bunker is automatically printed on this ticket which is in duplicate and one copy is given the representative of the boat.

Present plans call for a gang plank to be erected on the front of the machine which will operate similar to the chutes so that it can be lowered to the rail of the vessel and the captain or chief engineer can walk directly from the boat into the scale house and see the whole operation. Men on the dock will take care of fore and aft lines, consequently, it will not be necessary for any of the employes of the boat to get off to go on the dock for this purpose.

The machine was placed on the upper end of the property and the adjoining dock front has been leased for mooring privileges. There is ample room for mooring boats properly while taking fuel and there are proper mooring facilities on the dock.

There is another advantage in placing the machine where it is. Should a boat be fueling and one or two boats be waiting to fuel they can tie up at the lower end of the property which, of course, is more satisfactory than going to anchor in the river. This particular location is at one of the widest points in the St. Clair river which is a distinct advantage because boats down bound must turn and head up stream while boats up bound can keep over to the port side and come right into the dock. Another advantage is that the machine being located on the Port Huron side of the river makes it more convenient for boats leaving the dock that must turn and proceed down bound in that they make their turn on a port wheel and can practically get about in their own length.

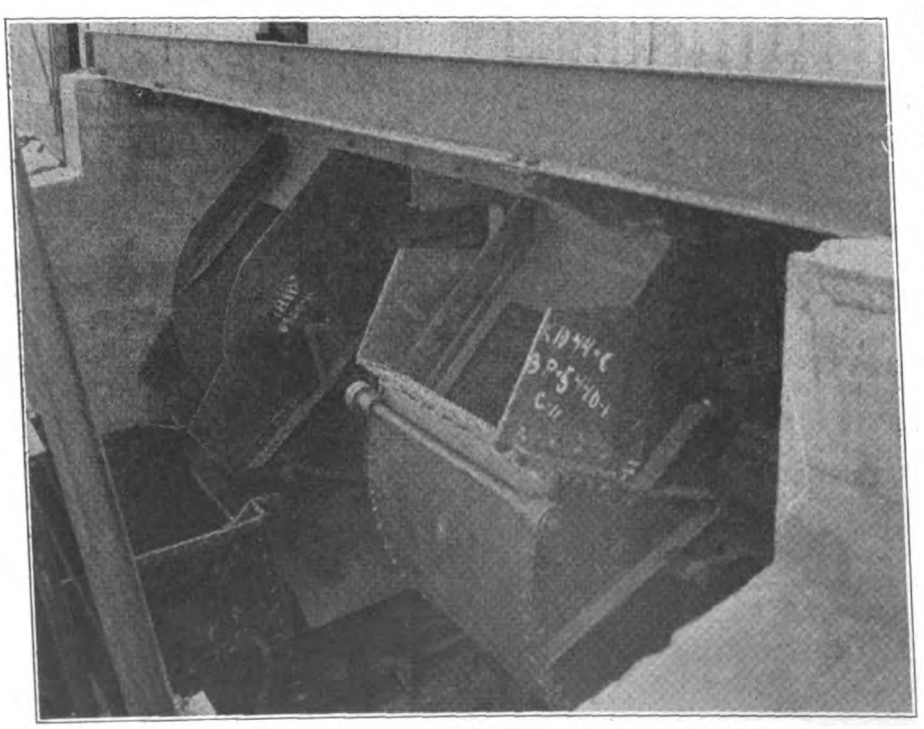


A CLOSE UP VIEW OF HOW THE ENTIRE MASSIVE UPPER STRUCTURE OF THE NEW MACHINE FOR BUNKERING IS CARRIED ON FAIRBANKS SCALES

The chutes and the machine in general was laid out so as to amply take care of the largest boats now on the lakes or under construction. Particular attention has been given to the lighting equipment on the docks and no effort has been spared to make it as satisfactory as possible.

Most of the coal which has been placed over the tunnel will flow through the openings to the belt by gravity, however, a locomotive crane has been fitted to pick up the coal from the sides and place it on the tunnel when the occasion requires. There is a storage capacity for about 30,000 tons. The entire dock front along the property as well as the adjoining property where boats are moored has been entirely rebuilt and of wood construction.

It is expected that nothing but high grade West Virginia coal will be used for fuel. The chutes through which the coal flows into the bunker are covered, consequently, eliminating considerable dirt and dust as well as deadening the noise. The machine was designed and erected by the Cleveland-Cliffs Iron Co. and patents have been applied for. The company's engineers are now designing a small hopper to be placed on the front of the machine which will have a collapsible tube arrangement for fueling small craft. However, the coal will flow from the bin through a door at the base of the large chute into the small bin, thence through to small craft thereby still making it possible to weigh all coal handled.



HOPPERS AT THE END OF THE BELT CONVEYOR—COAL FROM THESE HOPPERS IS DUMPED INTO THE SKIP BUCKETS—ONE SHOWN IN LOWER POSITION AT LEFT READY TO RECEIVE A LOAD—WHEN LOADED THE SKIP BUCKET MOVES UP TO THE OVERHEAD BINS

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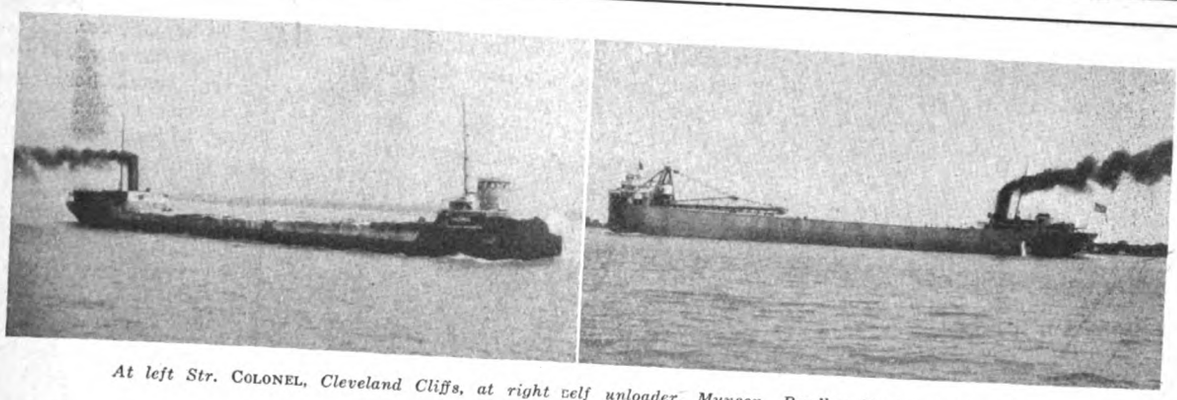

At left Str. COLONEL, *Cleveland Cliffs, at right self unloader, Munson, Bradley Transportation Co.*

Reduce Lake Vessels' Fuel Bill-II

A Study of the Influence of Boilers, Main Machinery and Auxiliaries on Earnings of Great Lakes Cargo Vessels

By Henry Penton

THE impression seems to be widely held that scale-forming solubles in the water of the Great Lakes have been increasing of late years. A very careful inquiry among laboratories dealing with such subjects fails to adduce any support for this belief. Certain local waters have given evidence of added impurities in different forms but not much if any thing in the way of lime sulphates. Local waters also carry more or less in the way of suspended matter not properly scale forming and varying more or less with the seasons. Most of these impurities, including the sulphates, can be precipitated by heating the feed water to a suitable temperature before its dispersion into the boiler proper. For many years there have been in use certain forms of purifiers designed to effect this purpose and functioning more or less successfully, depending upon the intelligence employed in their operation. These may be divided into two classes, external and internal as regards the boiler. In both the feed water is raised to steam temperature by contact with live steam and precipitation allowed to take place before overflow.

Water Purifiers Work Well

Practically the only form of external type employed was devised upwards of forty years ago by the late Robert Learmonth as an adjunct to existing boilers where the addition of any internal device was impracticable. It is in all essentials identical with several devices well known and widely used in shore plants. It is massive in construction and huge in proportions, entailing high first cost, including foundations, fastenings and connections. The connections are of large size because feeding is by gravity only, and are entirely additional to ordinary requirements and quite costly. The device is blown down usually at about six-hour intervals.

The internal type best known can be most easily identified as the Brews and makes description unnecessary. This form is light in weight, takes no additional space or foundations, no additional piping whatever, no exposure, and the rise in temperature is effected almost without loss of heat because the entire arrangement is inside the boiler. It is also blown out at stated intervals.

With regard to purifications the writer's experience has been that one is about as efficient as the other, but the difference in first cost, weight, and cost of operation is material. The heat lost in blowing down alone, is, with the internal type, only a fraction of that with the external because of the much smaller volume of water discharged. In neither case however is the heat loss more than fractionally that shown above for the surface condenser. Either, properly operated, will furnish better water than can be had by using the surface condenser and at a fraction of the cost. It may be admitted that probably neither will deliver 100 per cent pure water to the boiler but they will approach it much nearer than the surface condenser because the latter cannot deal with the make-up feed. The amount of this feed is a variable and cannot be more than roughly esti-

This is Part II of Mr. Penton's article. Part III will be published in an early issue.

Omitted from Part I

In the quotation from Weisman, Hamburger Technische Rundschau given in Part I of this article, page 66, February issue MARINE REVIEW, *the following results obtained by him from experiments with a triple engine were unintentionally omitted.*

(1) Working with *superheated steam* the following results were obtained:

	Cut-off	Pressure	Mean pressure	I.H.P.
H. P.	53%	176	79.7	319.7
I. P.	53%	45.5	22.8	240.5
L. P.	54%	4.27	8.25	224.1
				784.3

Revolutions 72, vacuum 26.4". Coal consumption 15.4 tons per day, 1.83 pounds per horsepower hour.

(2) Working with *saturated steam* under the same conditions as above:

	Cut-off	Pressure	Mean pressure	I.H.P.
H. P.	53%	176	66.3	280.8
I. P.	53%	57	31.2	347.5
L. P.	54%	8.83	10.38	297.7
				926

Revolutions 76, vacuum 24.3". Coal consumption 15 tons per day, 1.47 pounds per horsepower hour.

Paragraph (a) in the same quotation should read "With semi-superheated steam etc."

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mated. At certain seasons it is greater than at others because of heat for accommodations, bleeding of deck machinery, whistle in fog, etc. Even if all condensate in auxiliary lines is recovered the make-up feed will seldom be below 5 per cent of total feed water. Harbor feed, in the absence of a purifier, must be entirely raw unless the surface condenser is kept in service and all auxiliary exhausts conducted thereto and this involves the use of a circulating pump and a condensate pump for no other purpose. It follows that if the surface condenser is to get attention all feed will be raw.

With the purifier on the other hand all feed is dealt with, or supposed to be. It follows also apparently that the surface condenser is only an approximation besides a positive added operating and investment cost.

It has been the writer's observation that most of the deposit found in boilers where purifiers have been fitted has found its way in through the auxiliary feed and never went near the purifier at all. This is a condition which no foresight or engineering skill or investment can overcome. It is the same thing which salts boilers at sea, regardless of surface condensers and evaporators. It is a state of mind also, and may be called indifference, or ignorance, or laziness, or all three, without slandering anyone.

Difference in Vacuum

With regard to vacuum; a somewhat better vacuum is obtainable with the surface condenser provided no leakages exist, but the difference is much less than is usually believed. There is no difficulty in the way of obtaining 25 inches with a good jet condenser and well designed air pump, or even 26 inches on Lake Superior. This is only about 3½ inches less than normal barometer. It is seldom done because of the resulting lowering of hotwell temperature. But since there is a constant relation between vacuum and temperature regardless of type of condenser, the latter being in a sense merely a means of establishing that temperature, why is a low temperature less objectionable with a surface condenser than with a jet? Especially when, for a given hotwell temperature the jet type will produce a better vacuum than the surface. For example the vapor temperature corresponding to 24 inches of vacuum is 140 degrees Fahr. There is no difficulty with a good jet condensing plant in obtaining a condenser temperature of 134 to 136 degrees. Better has been done and maintained under regular working conditions but is hardly to be expected. The temperature will depend somewhat upon the temperature of injection because the loss is due to air of which a small part comes over with the exhaust but mostly with the injection water, and therefore the colder the latter and the smaller its volume the less the quantity of air to be removed. It is the removal of this air which is the chief duty of the air pump; the handling of the water is only incidental.

Lower Hotwell Temperature

With the surface condenser the cooling water and the exhaust do not come in contact at all and yet the temperature for a 24-inch vacuum with the ordinary design almost never exceeds 120 degrees and is more likely to be less. This is mostly due to the fact that the condensed steam, in falling to the bottom of the condenser, has to pass the coldest tubes, and thus comes about a condition which is the exact antithesis of the jet type, that is to say that whereas colder injection with the jet type brings about higher hotwell temperatures it still further reduces that temperature in the surface type. If the vacuum is carried to 26 inches the temperature will fall another 15 degrees.

There is a theoretical possible saving of about 1½ per cent in steam in the ordinary reciprocating engine for each inch of vacuum, but a loss of 15 degrees at the hotwell almost exactly balances and cancels this unless waste heat is available from some source to restore it. Moreover, beyond a certain point, a higher vacuum produces little or nothing in the way of additional power because in the reciprocating engine with positive valve gear equalization of pressures between the low pressure cylinder and the condenser is not feasible under normal working conditions. Resistances in passages, inconstant areas of passages through the valve faces, intermittent flow and probably to some extent re-evaporation, all combine to prevent equalization. The writer has taken scores of diagrams from different engines at normal speeds with vacuum varied from 22 inches up to 26 inches or 26½ inches and found that after 19 inches or 20 inches was reached in the cylinder, say with 23 inches to 24 inches at the condenser, improvement of the latter produced little or no effect in the cylinder. But suppose an engine with a 65-inch low pressure cylinder and suppose the added 2 inches of vacuum to be realized in the cylinder it would perhaps approximate 0.9-pound in added mean effective pressure which would produce about 55 indicated horsepower. If our engine is costing us say 14 pounds of steam per indicated horsepower per hour the saving should approximate 775 pounds of steam per hour, but to get this is costing us, as has been already pointed out, some 1200 pounds of steam per hour or over for the circulating pump. Hence the higher vacuum represents an actual loss.

The jet condenser is a simple, inexpensive, and utterly reliable piece of apparatus, and in discarding it owners are not well advised. The condenser itself, in its modern form, first introduced by the writer in the *Pathfinder* in 1892 and subsequently generally adopted, is free from the objections associated with older forms, giving constant velocities of injection at any and all rates of working regardless of area of opening and in consequence exact adjustment of the injection water to the needs of the moment. This combined with perfect drainage to the foot valves resulted in an immediate improvement in hotwell temperature and in the duty imposed upon the air pump.

Air Pump and Condenser

One of the impelling motives for the introduction of the surface condenser grew out of the adoption of a certain type of air pump which offered somewhat cheaper construction by elimination of the bucket and foot valves of the well tried and universally used single-acting pump. As was pointed out at the time, however, this type could only function, with any approximation to efficiency, when working at normal speeds, and at low speeds, as when maneuvering for instance, would be unsatisfactory and it so proved. The jet condenser was held responsible for the poor vacuum and the surface type taken up when all that was necessary was to discard the valveless pump and retain the older type of which many hundreds are in use and giving perfectly satisfactory service. The single-acting pump, with foot, bucket and discharge valves, when well designed, giving low bucket speeds and water velocities, has no equal for the service and will run year after year almost without attention or expense. An impression seems to have gained ground that the surface condenser is a more efficient device, whereas it is the outgrowth of dire necessity and merely represents a choice as between two evils. We have embraced one of the evils where the other did not exist.

(*Continued on Page* 50)

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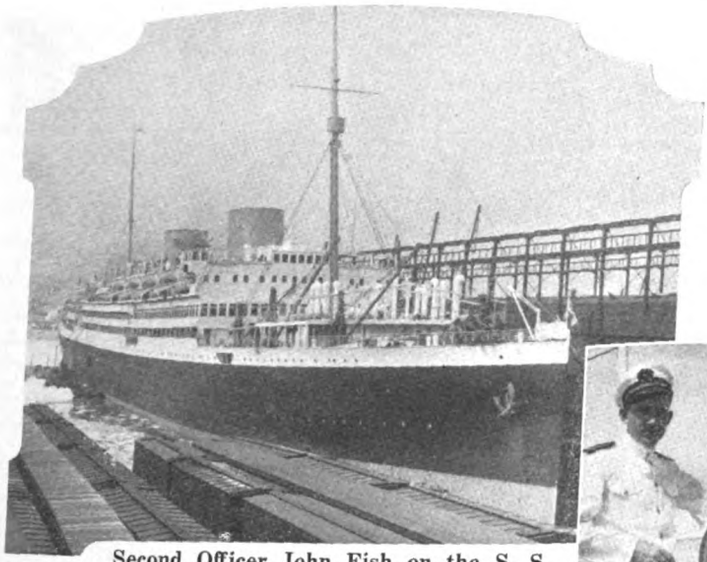
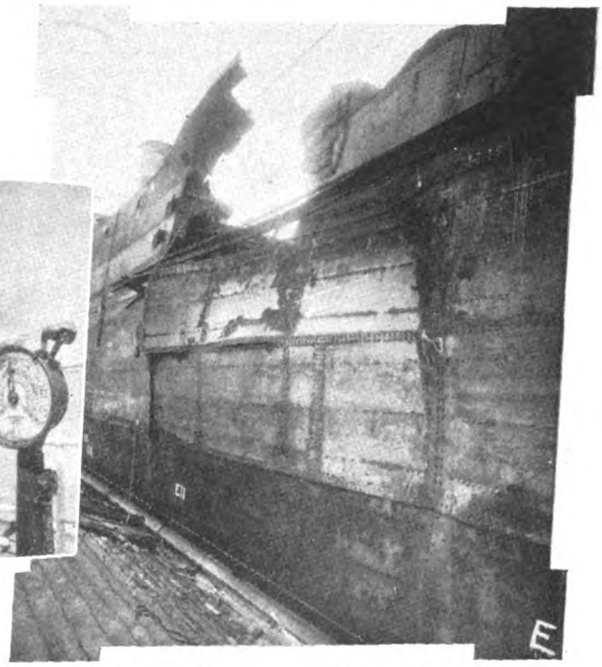
Latest Marine Events in Pictures

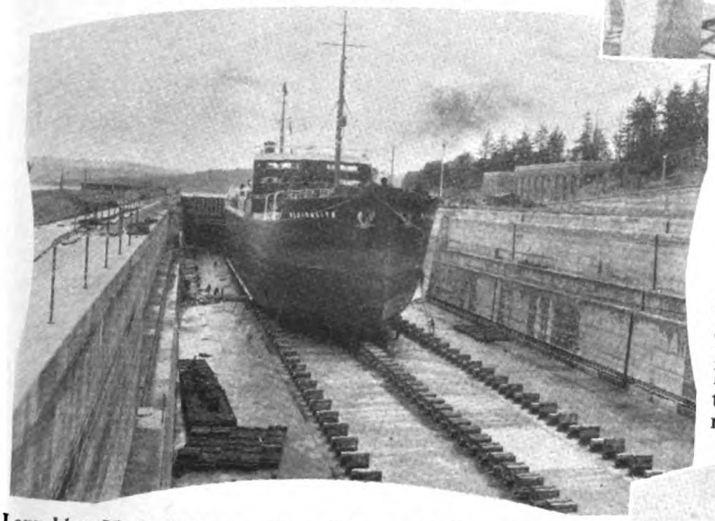


Royal Mail Steam Packet Co.'s new passenger motorship Asturias at New York before sailing on a four-months' cruise to South America, Capetown, East Africa, Mediterranean and back to New York. An idea of the spaciousness of this ship, two autos can drive abreast on each side of her decks

Second Officer John Fish on the S. S. Scottsburg, using the Cory signal to engine.

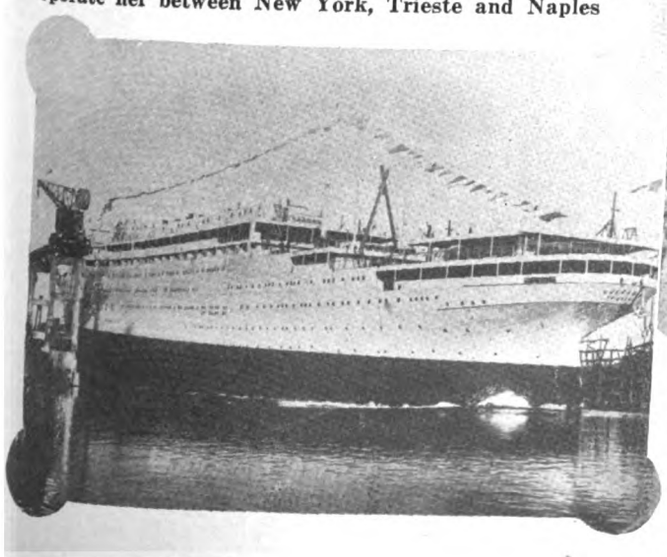


First ship docked in the new 1150-foot drydock at Victoria, B. C., Sept. 13, 1926

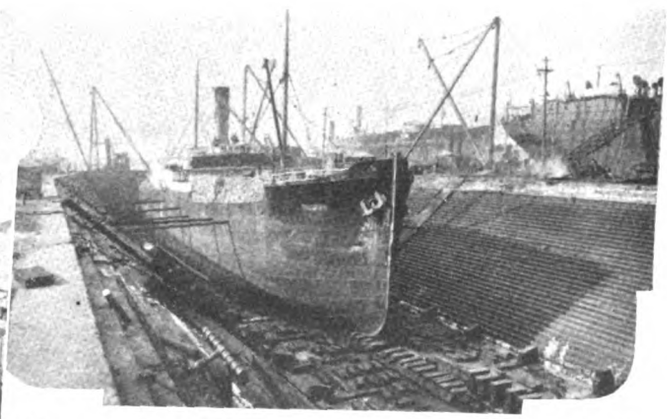


Tanker Agwison sunk in an explosion at Brooklyn, N. Y., was raised Jan. 22, and towed to the Robins plant of the Todd Ship Yard Corp.

Supplies delivered to ships at Duluth in gasoline launch by the Duluth Marine Supply Co.



Launching M. S. Vulcania, Monafalcone, Italy. Of 36,000 tons is the largest motorship. The Cosulich line will operate her between New York, Trieste and Naples



Norwegian S. S. Terje in collision, East river, N. Y., Jan. 23, entered Robins drydock fully loaded for survey of damage

Pere Marquette carferry No. 21, Milwaukee harbor.

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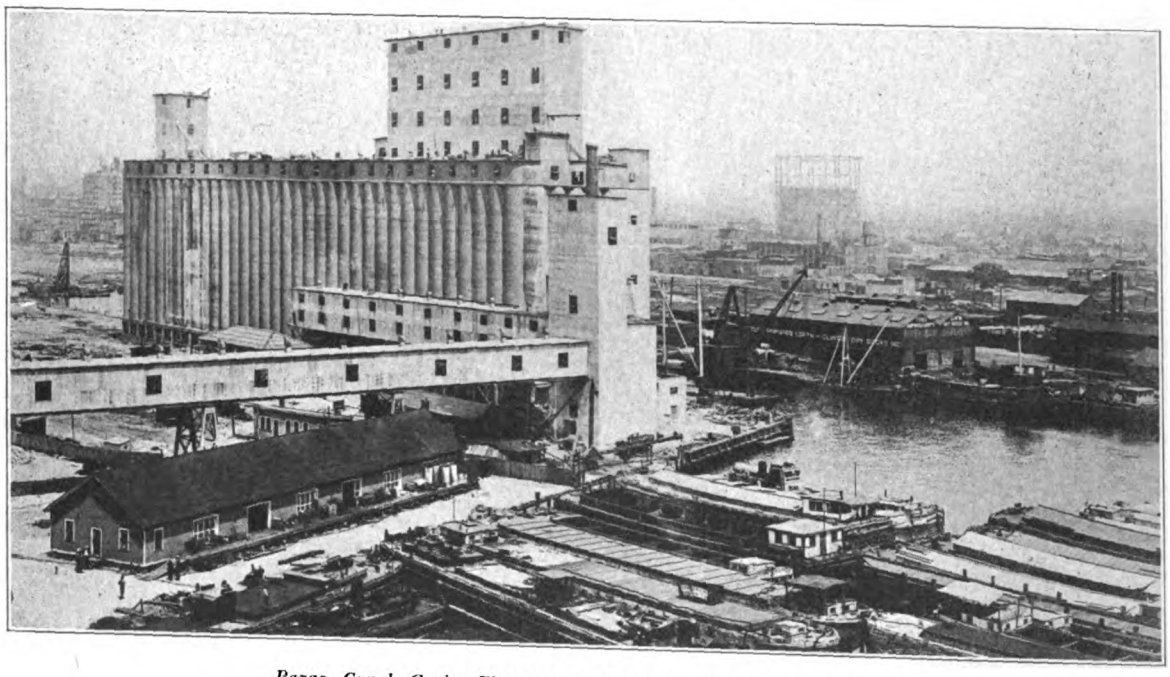
Dock Management Progress Section

How Successful Dock Operators Have Met Problems of Giving Best Service to Ships



Barge Canal Grain Elevator at Gowanus Bay Brooklyn, N. Y.

Barge Canal Terminals Are Ready for Increased Traffic

BY MAURICE W. WILLIAMS

A BARGE terminal is a place where freight can be conveniently loaded into or unloaded from a barge. The nature of the bank should be such, by a vertical wall or otherwise, that the barge can lie close to the shore. Since freight has to be hoisted into and out of hold-loading barges, like all those now operating, and since they do not carry their own facilities, freight-handling equipment has to be provided, otherwise the freight cannot move. On shore there must be more or less space, approximately level, on which freight-carrying vehicles can maneuver and freight can be deposited temporarily. Some of this space should be paved, and a connection with the municipal street system is necessary. For protection to certain kinds of freight subject to theft and weathering a freight house has to be provided which, no matter of how good quality, is always called a shed. Since load-carrying vehicles on shore consist not only of drays and motor trucks but also of railroad cars, tracks are a component part. Special terminals require special facilities; for instance, to handle grain there is required a grain elevator, but this is only a specialized form of terminal.

Design of Terminals Vary

These are the elements of terminals, but not all of them may be essential in any given case. Obviously railroad tracks are out of place unless there is a railroad nearby which by its angle of direction with the canal would be a distributor or feeder of canal freight. Thus the Troy terminal, from which radiate the Boston and Maine, the Rutland, the Delaware and Hudson, and the Boston and Albany railways, is incomplete without tracks while the terminal at Little Falls is complete without them since the West Shore, a stone's throw away, is a feeder for neither local nor long distance traffic. If a terminal is to be used only for imperishable freight of low value, no shed is necessary.

In the light of these requirements the terminals of the New York State barge canal are excellent both in design and execution. As a whole they are walled, paved, shedded, connected, tracked and equipped for immediate use and being so they have been commended by many of their possible users.

Undoubtedly a greater use would disclose weakness and shortages in some of them. This is a condition to be expected with any growing

The author, Maurice W. Williams, consulting engineer, New York, acted in that capacity in connection with the barge canal terminals for a period of four years.

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transportation artery, just as the 75-foot canal channel has been outgrown already.

It is unnecessary to enumerate the terminals provided by the state beyond saying that at least one has been installed at every city on the barge canal system, including New York and points on Lake Champlain, and at many villages. In nature, type, extent and equipment they range from the one at Gowanus bay in Brooklyn, which includes a grain elevator and a pier equipped for steamships and barges, through various piers and quays with or without equipment, down to a retaining wall which was built in ordinary canal construction and which can now be used in an emergency for loading or unloading barges. All told there are 60 such terminals, in 50 cities or villages, aggregating about 11 miles of dockage, and they have cost about $20,000,000.

Way Terminals Are Not Used

Most of the terminals except those located at termini, however, are unused to any extent. Of the intermediate terminals probably the one at Rochester has been used most of all, but even there the traffic passing over it has borne only a minor relation to the immensity and completeness of the terminal as a whole.

The principal reason for the limited use of the terminals is the complete lack of a packet or port-to-port service and the almost complete lack of short haul, or terminus-to-intermediate-port, service. Something of an exception has existed at Rochester, where more or less of a water line connection with New York has existed for several years. The movements of ore from Port Henry to New York and of salt from points on the Cayuga-Seneca division do not constitute exceptions because they take place from private terminals. The terminals as a whole are not likely to be used to any extent until there is a packet service.

Although the terminals have not been used much so far they are virtually the only means by which way ports can ever utilize the canal, now that the route is remote from most of the industrial plants. As has been brought out above, some sort of a terminal is necessary where a barge is unloaded or loaded. Not only has the state established the policy of providing public terminals and is thereby obligated in principle to expand and supplement them as the growth of traffic warrants in the future, but the very fact that they are ready for business and generally occupy the best sites will tend to discourage building private terminals for public traffic. The two outstanding exceptions to this situation are the terminals erected for public use by the Rochester Terminal & Canal Corp. at Rochester in 1922 and by the Empire Builders Supply Co. at Niagara Falls in 1925 at a cost of $100,000.

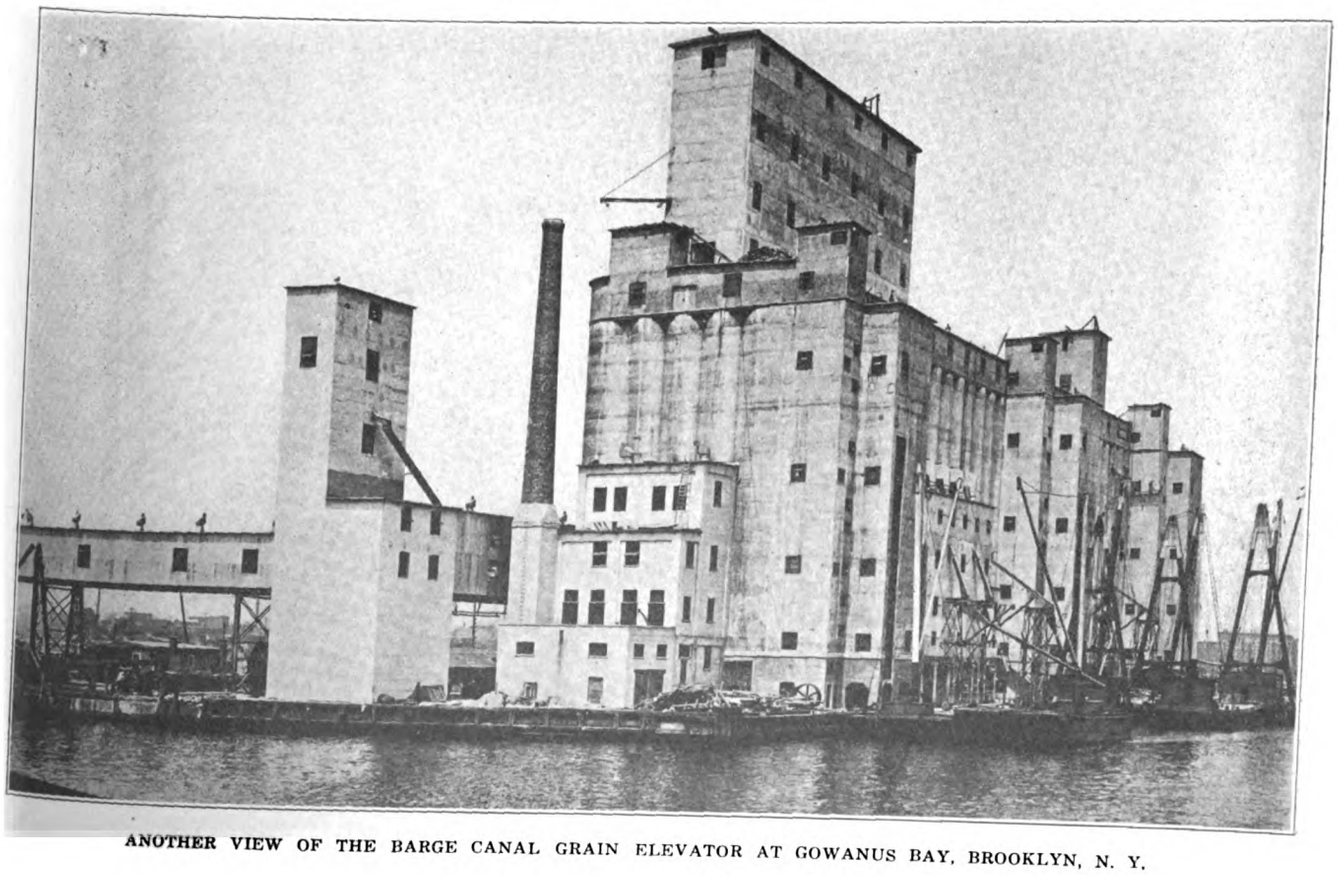
Terminals Must Precede Service

Without terminals the local freight simply cannot move and there will be no visible indication that it would have moved. A barge never arrives at a way port looking around, so to speak, for a place to discharge cargo destined for that port, but her oper-

(*Continued on Page* 54)

Maintain Canal Depth

A barge canal without adequate terminals is of no economic benefit to the communties it is intended to serve. In the matter of terminals for its barge canal New York state has shown a commendable degree of vision. But the urgent need of this canal at the present time in addition to sufficent and proper terminals is adequate maintenance of a minimum depth and width at bottom to correspond to the locks. The locks now allow an effective draft of 12 feet but the operating draft in parts of the so called 12-foot channel of the canal is not over 10 feet as a limit. To keep in step with the times, to allow the use of larger barges forming economic units of long distance canal transportation, the entire restricted portion of the barge canal system should be widened and depened to a minimum of 14 feet and then carefully maintained at these limits.



ANOTHER VIEW OF THE BARGE CANAL GRAIN ELEVATOR AT GOWANUS BAY, BROOKLYN, N. Y.

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Late Decisions in Maritime Law

Legal Tips for Shipowners and Officers

Specially Compiled for Marine Review
By Harry Bowne Skillman
Attorney at Law

GENERAL agents of a steamship, who collected all the freight and signed bills of lading, it was held in ESTRADA PALMA, 8 F. (2d) 103, were not entitled to a lien for the amount of a claim filed by them.

* * *

FILING of petition in bankruptcy against owner of vessel and appointment of a receiver is sufficient cause for nonpayment of seamen's wages within the time required by law, to prevent the imposition of a penalty, which, being a personal claim against the owner or master should not in any event, said the court in the case of ACROPOLIS, 8 F. (2d) 110, be paid from funds looked to by subsequent lienors.

* * *

MARITIME liens of the same voyage, except as to seaman's wages, etc., are paid pro rata, in the event that the fund is not sufficient to pay them in full, according to the decision in the case of COMMACK, 8 F. (2d) 151. Such liens, it was said, are settled by payment in the inverse order of their acquisition; liens acquired during the latest voyage being settled before liens of the same class acquired during a prior voyage. However, neither the master, owner, nor marshal can affix a martime lien to any vessel after seizure under process.

* * *

A CONTRACT for towage, exempting the towage from liability for negligence, is valid, as not against public policy.—PACIFIC MARU, 8 F. (2d) 166.

* * *

ACTION for the death of a seaman, resulting from a fall through an improperly lighted hatchway, was held, in the case of Luckenbach Steamship Co. v. Campbell, 8 F. (2d) 223, maintainable under act of March 4, 1915, section 20 as amended, notwithstanding death occurred on land A verdict for $5000 was held not excessive.

* * *

PUBLISHED tariff under section 18 of the shipping act, subject to which a steamship passenger's ticket is sold, becomes part of the contract of transportation, it was decided in Pacific Steamship Co. v. Cackette, 8 F. (2d) 259, and the passenger is chargeable with notice of everything properly contained and by law required to be inserted in such tariff; "tariff" being ordinarily understood to be a system of rates and charges. It was further held that a provision in a published tariff, requiring a passenger's claims for loss or damage during a voyage to be filed within 10 days, was not binding on a passenger, though ticket was sold "subject to conditions of lawfully published tariff"; the provision having no relation to rates and charges, and not being such as was required to be inserted in the published tariff.

* * *

WHERE damages to the cargo of a vessel, engaged in governmental service, was attributable in part to unseaworthiness of the vessel and in part to collision, full damages may be recovered from the party responsible for the collision; neither the government nor a vessel engaged in government service being liable to suit, according to the case of United States v. City of New York, 8 F. (2d) 270. The English rule that owners of the cargo can only recover proportionate share of their damages from parties liable therefor does not apply in United States courts, where recovery of the whole damages against either wrongdoer is permitted.

* * *

TO CHARGE a common carrier with liability it is not necessary that loss or damage shall have been of or to cargo physically moving in transit, but only that goods shall have been delivered and accepted for transportation; hence, said the court in McLeod Lumber Co. v. Crowley, 8 F. (2d) 283, rafts of piling delivered alongside a vessel and partially loaded were delivered "for transportation." so that liability of the carrier for their loss attached, notwithstanding the shipper reserved the right to cull out and have thrown back into the water poles found to be undesirable after loading. However, it was held that a raft of piling, tied to an adjacent dock, unconnected with that at which the vessel was lying, in readiness to be moved alongside when other rafts tied alongside were loaded, was not "delivered for transportation" to the vessel, so as to render it liable for loss of the raft.

* * *

MERE sale and delivery is enough to confer title to a teamship; documentation and bills of sale and registration being for the purpose of fixing the vessel's status and to give notice to purchasers and mortgagees. —AUGUSTINE, 8 F. (2d) 287.

* * *

PART of crew of government-owned steamship, which was wrecked and sunk in Arabian sea, proceeding to England were not entitled to their transportation allowance —Villigas v. United States, 8 F. (2d) 300.

A SHIPOWNER, entering on a contract of carriage, impliedly warrants that the vessel will not deviate unless compelled to do so by necessity; the effect of a deviation, unjustified, is to displace the contract made between the charterer and the vessel owner; necessity might excuse a vessel's deviation, but that necessity must be one arising at sea during the course of the voyage, not one occurring at the loading port prior to the inception of the voyage.—MAINE, 8 F. (2d) 291.

* * *

FACT that railroad strike prevented a shipper from supplying cargo is no excuse for nonperformance of the contract, in the absence of such a provision therein, the court held in United States v. Columbus Marine Corp. 8 F. (2d) 315; and, in New York & Cuba Mail Steamship Co. v. Lamborn, 8 F. (2d) 382, it was decided that where a charter party contained no strike exception, the charterer was liable for demurrage for delay caused by a strike, inasmuch as the charterer takes the risk of all unforeseen circumstances.

* * *

THE tug is protected in obeying within reasonable limits the orders of the pilot who is in charge of the movement; but, if damage occurs through the negligent manner in which the tug executes a proper order, the tug is at fault."—Cary-Davis Tug & Barge Co. v. United States, 8 F. (2d) 324.

* * *

DUE diligence of carrier to make a vessel seaworthy is not shown by the "hose" test, at high pressure, rather than by flooding, of the shaft alley, and this three years before her maiden voyage. The requirement of due diligence is not satisfied by diligence in procurring surveyors' certificates.—Newhall v. United States, 8 F. (2d) 422.

* * *

OWNER of vessel, entering into charter party containing warranty that vessel shall be tight, staunch, strong, and in every way fitted for voyage, is bound to see that the vessel is seaworthy, and is not excused by the fact that a defect is latent and unknown; nor is the owner relieved from liability by reason of his having used due diligence in inspecting the vessel.—Pan-American Trading Co. v. Franquiz, 8 F. (2d) 500.

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Safety Equipment Is Recommended

Marine Standards Committee Studies Safety on Shipboard—Suggests Methods and Equipment Beyond Legal Requirements for Greatest Safety

REALIZATION of the relative importance of conservation of life and property in ship operation prompted the American marine standards committee to give the subject of safety equipment an early place in its active program, with the idea especially that the subject should be kept under study so as to keep the industry informed abreast of progress.

A subject committee on safety equipment was organized under the general supervision of the technical committee on ship operation details and supplies, the function of which, as briefly stated when it was organized, is "to recommend safety equipment and spare parts to be carried by ships of various types and services, with such specifications as deemed advisable for marine standards, including typical specifications for life preservers." In line therewith the committee suggested that safety and welfare on shipboard could be enhanced by the employment of certain methods and equipment in addition to those now required by law, and it recommended a list of items believed to provide for the utmost practicable safety under present conditions. Such list has been approved for general information and reference.

It is believed that all of the safety means recommended have had their merits proved by actual use; that all of them are practical; that none of them involves expenditure disproportionate to the material benefits derivable from their judicious and appropriate use, and that all of the appliances specifically mentioned are obtainable in various types or makes in the open market and therefore open to competition.

It is recognized that the list does not apply indiscriminately to all ships irrespective of size, type or service and that different ships would require only certain ones of the items listed to make them as safe as practicable for their respective services. The recommendations should be understood as an expression of opinion as to what would constitute maximum safety provisions on a ship of such size and type and in such service as to make desirable all of the means set forth.

In line with the preceding foreword, the following list is presented merely as a statement of modern safety practice and without intention of making its adoption mandatory either in whole or in part. It is issued for general guidance only and as basis for the committee's further work in developing standard specifications. The items are listed without regard to their relative importance, as follows:

From a report of the subject committee on safety equipment organized under the auspices of the American marine standards committee.

1—Safety in Navigation

(a) *Gyroscopic Compass*—The safety of a ship is enhanced, and the accuracy of navigation increased, under all conditions, by the installation of true north gyroscopic compass of recognized effective type.

(b) *Signal Receiving Apparatus*—The installation of either a radio compass or submarine sound receiving apparatus, or both, is regarded as contributing materially to the safety of ocean-going vessels.

(c) *Automatic Depth Sounding*—The installation of some recognized effective type of automatic depth sounding apparatus makes possible an increase in efficiency of navigation and adds to the safety of the ship.

2—Fire Protection

(a) *Fire Detection Systems*—Passenger and crew's quarters, also cargo spaces, should have fire detection systems of recognized effective types, so installed as to give indication and location of a fire in its early stages.

(b) *Fire Extinguishing Systems*—(1) The fire rooms of vessels using oil for fuel should have fire extinguishers of the foam type, of adequate capacity and conveniently located for instant use, or fire extinguishing systems of approved type so designed and installed as to be operated from outside of compartment. Engineer officers and fire room crews should be fully instructed in regard thereto. (2) Much damage to cargoes would be prevented by the installation in cargo holds of simple piping systems for delivery therein of carbon dioxide or similar gas to smother a fire. This is recommended in lieu of water or steam systems which are no more economical in first cost, are not as effective and cause unnecessary damage when used.

(c) *Fire Screen Bulkheads*—The safety of life and protection of property would be materially enhanced by constructing proper fireproof bulkheads or other means to keep fires isolated.

3—Personal Welfare and Safety

(a) *Alarm Signal Devices*—Adequate arrangements either electrical or mechanical should be provided in refrigerator spaces to enable persons in danger of being overcome or inadvertently locked therein, to give an alarm signal for rescue.

(b) *Safety Guards*—The gage glasses of boilers should be provided with safety guards to prevent the scattering of pieces when they break under pressure.

(c) *Shaft Alley Escape*—Easy means should be provided for opening the upper exit door from inside at all times.

(d) *Life Lines*—The proper location of life lines for all conditions of service should be diagrammed and appropriate fittings should be installed to effectively secure them. Those responsible for the placement and use of such lines should be instructed with respect to their proper installation and securing. Claims for damages based on improperly secured life lines are frequent and would be largely eliminated by following this practice.

(e) *Safety Devices*—The operating gears of maneuvering valves of turbines especially, should be so designed with interlocking devices as to effectively prevent erroneous handling and consequences.

(f) *Markings for Passages and Exits*—Adoption of a standard system of direction markings to guide persons to exits to facilitate escape in cases of fire or other emergency is recommended.

(g) *Ventilation of Quarters*—The living quarters on all vessels should be adequately ventilated but on motor vessels the subject should be given special consideration in view of the risk of pervasion of gas.

4—Emergency Provisions

(a) *Gas Masks or Breathing Apparatus*—Ocean-going vessels especially those carrying oil as cargo, or for fuel, should be equipped with breathing apparatus for use by persons entering spaces in which there is fire, or in which the oxygen content of the air is likely to be consumed, or deficient to sustain life. Vessels using

Economy in Protection

Codes for the common welfare are imposed by legislation when manifestly needed but may be established by custom brought about by co-operation of mutual interests. It is generally more economical in the long run to voluntarily adopt progressive measures than to await their compulsion by power of legislation and it is thought that by co-operative promotion of the greatest practicable safety in their operations, the marine interests can not only retain the greatest freedom of control in their field but also exercise the utmost individuality in the selection and adaptation of means and methods best suited to their needs.

American Marine Standards Committee

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ammonia ice machines, or carrying cargo liable to create dangerous atmospheric mixtures should be equipped with suitable all purpose canister gas masks (or equivalent) of types approved for the required service by the United States bureau of mines. The location of such equipment should be generally made known and all persons liable to require its use should be instructed and drilled in the use thereof.

(b) *Metal Cutting Outfit*—Distortion of the steel structure in collision may imprison persons whose release can be effected only by cutting parts of the metal structure, and such cases would require quick action. For such emergencies an approved cutting outfit would be desirable equipment.

On vessels in which electrical current is distributed and assured with reasonable certainty under all circumstances, such may consist of an electrical outfit.

On vessels equipped with air compressors, such may consist of hand-operated compressed air tools provided that there is a compressed air piping system with outlets for convenient hose connections and sufficient air hose to reach the essential parts of the ship. A compressed air tool outfit would also serve the purpose on vessels having no stationary air compressors, by providing a suitable portable motor-driven air compressor.

Such may also consist of an oxy-acetylene burning outfit but when this is carried it should be stowed in a location readily accessible and unsusceptible to wide variations in temperature and secured in a manner ensuring safe stowage but permitting easy removal. It should be under charge of members of the ship's personnel competent to use it, either from actual experience or by special instructions.

The purpose of carrying any such outfit on the vessel should be made known to all of the ship's officers.

In conclusion, it is pointed out that the proper sea-going condition of a ship should be ascertained while in port; that safety at sea can best be assured by making proper preparations before proceeding on a voyage, and that this principle should be impressed upon ship owners and licensed officers as fundamental to the welfare and best interests of all concerned.

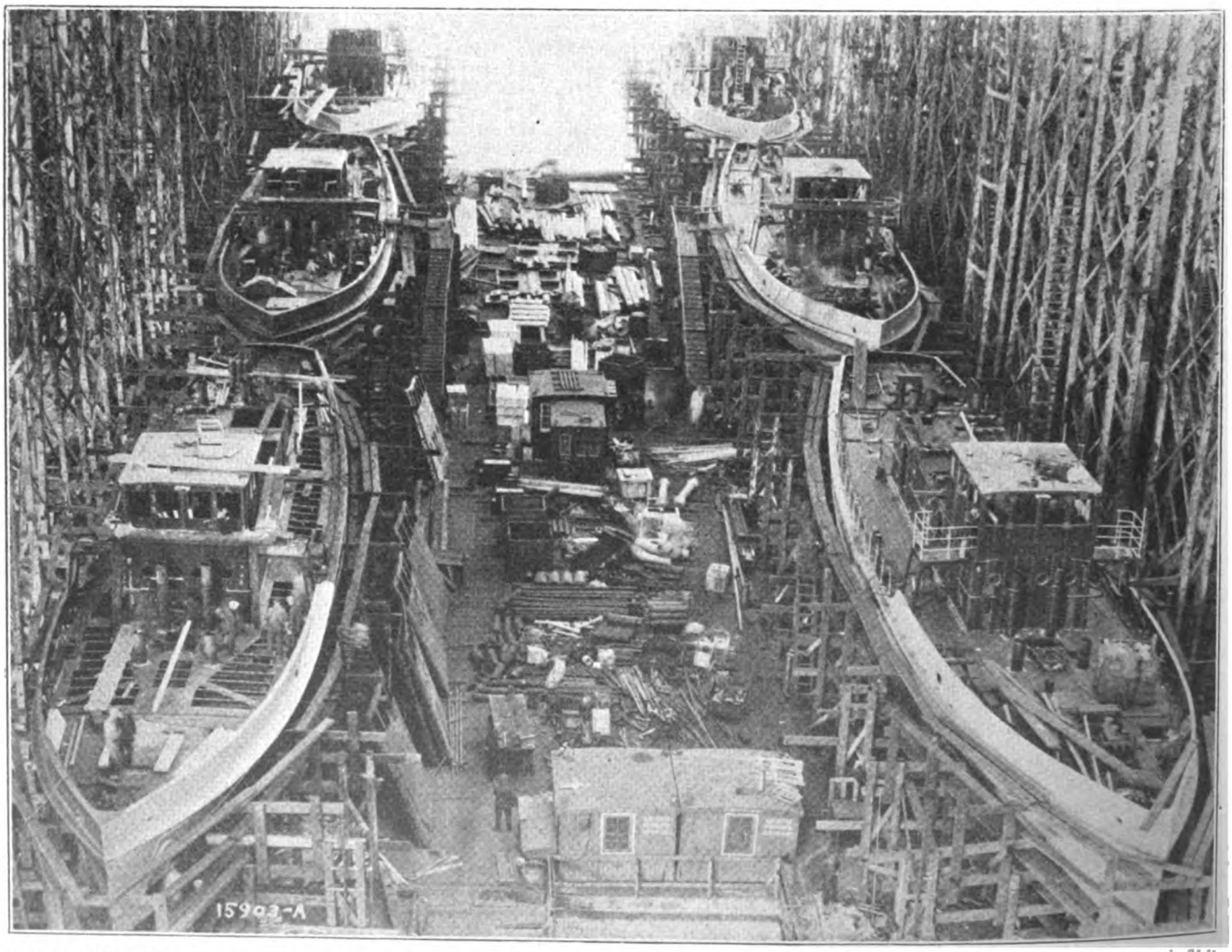
Coast Guard Boats

(*Continued from Page* 19)

of CO_2 gas, with piping and control gear; one air signal horn and air compressor with motor and control; one heating boiler fitted with a rotary hand fuel oil pump of approximately 6 gallons per minute capacity at 20 pounds per square inch pressure; radio motor generator; searchlight; and electric windlass.

The fuel oil bunker tank under service conditions has a net capacity of about 6650 gallons, while capacity of the fresh water tank is about 1500 gallons. Trials of the main engine are made at the dock with the engines delivering maximum power. After the dock trial the underway trials are held which consist of a two hour continuous run at full speed to test the machinery installation. The first and last boats are to have trials over a measured course to obtain performance data.

Seven additional guard patrol boats were launched on Jan. 27 at American Brown Boveri Electric Corp., Camden, N. J. These vessels are similar to the six launched on Nov. 30, and are part of the government contract for 33. The launchings passed off smoothly and were materially aided by favorable winds which kept the ice clear.



WHEN THE AMERICAN BROWN BOVERI ELECTRIC CORP. OBTAINED THE CONTRACT TO BUILD 33 COAST GUARD PATROL BOATS, QUANTITY PRODUCTION METHODS WERE ADOPTED—TWO LARGE COVERED WAYS ARE USED, WITH SIX HULLS UNDERWAY ON EACH—THIS ILLUSTRATION SHOWS THE FIRST SIX BOATS BEFORE THEY WERE LAUNCHED LAST FALL—A COMPLETED BOAT IS SHOWN ON PAGE 19

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Equipment Used Afloat, Ashore

An Air Actuated Riveter for Riveting Steel Barges—Economical and Dependable—A Drop Forged Vise—Light but Strong

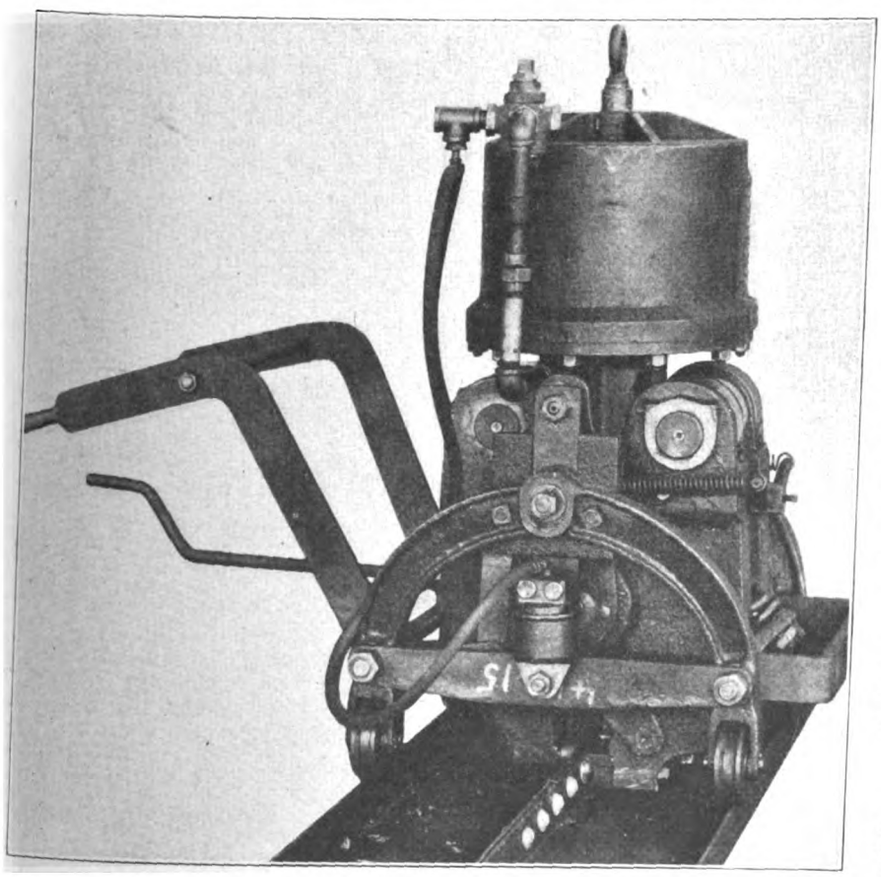
TO MEET the demand for a quick, economical, and dependable method of riveting steel barges the Hanna Engineering Works has developed a new riveter as shown in the accompanying photograph.

The riveter, which is air actuated, develops fifty tons on the dies when operated at 100 pounds air pressure which is sufficient for driving ⅞-inch water tight rivets. It is of the alligator type with dies horizontal, cylinder up. As the piston moves out of the cylinder, a wedge fastened at the outer end of the piston rod moves downward between rollers fastened at the top ends of the two jaws of the riveter, thereby closing the gap and squeezing the rivet. The entire machine weighs approximately 1500 pounds and is mounted on a cradle carriage to run on the two outer edges of the channels, or angles, which are being riveted. An operator rivets the full length of one seam and then moves the machine over to the adjoining seam and comes back riveting that one. All lost motion and time is thereby eliminated.

The cradle is provided with a "bucking up" lever or mechanism whereby the dead or immovable die may be nudged on and off the manufactured head of the rivet. The double flanged wheels of the cradle carriage are adjustable to various gage widths to compensate for variation in size of channels being riveted. The entire machine is moved along the channels from rivet to rivet by means of a hand wheel, chains, chain pinion and sprocket and wide face spurred gears meshing with the double flanged wheels of the cradle carriage.

The noses of the legs, or jaws, upon which the dies are mounted, have flat ends which develop the maximum of die supporting area for a given distance from center line of die to die of nose.

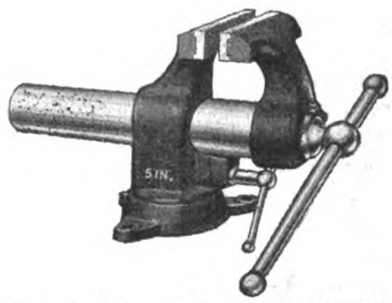
The die stroke characteristics of this machine are the same as the Hanna yoke riveter; the gap is closed quickly and with the expenditure of but very little air, and the tonnage which the dies are capable of exerting builds up to the maximum at one-half piston stroke. Throughout the balance of the piston stroke the tonnage on the dies is uniform. The air consumption of this machine is 10.5 cubic feet of free air per cycle.



AN AIR ACTUATED RIVETER SPECIALLY ADAPTED FOR RIVETING STEEL BARGES

All Steel Drop Forgings Bench Vise

Here is a new type vise made entirely of drop forgings, excepting only the handle. Each part is machined to be interchangeable with the same part of any other vise of the same size. The jaw plates are knurled and forged under the hammer and doweled onto the jaw. Thus it is possible to replace the jaw plates, which are naturally subject to wear.



THIS VISE IS MADE ENTIRELY OF DROP STEEL FORGINGS EXCEPT HANDLE

It is claimed that this vice is lighter in weight than the old fashioned cast iron type. It is made with a swivel base and wedge lock that is quick to set and automatic in tightening up, and has a grip that cannot shake or break loose. It is also made in the stationary type. Four sizes are made: three inch with jaws opening five and one-half inches; four inch with jaws opening six inches; five inch with jaws opening eight inches; and five inch heavy duty with jaws opening eight inches.

Each vise is sold under a full and unconditional guarantee on each part excepting jaw plates. The vise is manufactured by The Fulton Drop Forge Co., Canal Fulton, Ohio.

R. H. Farley, who retired as passenger traffic manager of the International Mercantile Marine Co., has opened with his son, R. S. Farley, the Farley Travel agency.

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Marine Business Statistics Condensed

Record of Traffic at Principal American Ports for Past Year

New York

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1927	417	1,736,991	455	1,868,270
December	466	1,867,630	548	2,171,938
November	454	1,909,756	477	1,885,401
October	486	1,954,853	542	2,301,465
September	492	2,087,694	543	2,270,398
August	491	2,034,147	507	2,075,643
July	493	1,943,133	546	2,251,396
June	542	2,337,678	563	2,279,208
May	448	1,856,777	538	2,126,788
April, 1926	483	1,967,964	538	2,248,081

Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)
(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1927	79	208,354	59	167,258
December	145	373,902	129	341,421
November	168	429,403	139	377,016
October	145	370,112	128	329,420
September	107	234,144	82	196,434
August	109	248,435	81	170,661
July	92	191,680	69	128,381
June	104	229,631	56	109,561
May	97	215,829	69	151,287
April, 1926	80	185,401	61	135,919

Boston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1927	88	266,147	51	159,241
December	97	286,013	52	170,314
November	89	275,245	56	177,876
October	109	300,921	58	171,933
September	105	308,189	83	246,136
August	128	321,377	96	206,879
July	152	336,135	108	274,513
June	164	370,526	109	262,468
May	134	277,009	111	261,878
April, 1926	101	285,245	77	210,542

Portland, Me.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1927	25	59,155	26	66,791
December	32	71,748	34	77,400
November	20	34,092	20	34,917
October	20	48,468	23	52,900
September	24	43,783	19	35,828
August	23	47,089	26	45,669
July	27	47,885	26	47,569
June	29	44,890	29	46,942
May, 1926	19	49,894	17	47,016

Providence

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1927	3	9,632	6	20,091
December	5	17,666	5	19,074
November	2	7,689	2	7,690
October	7	23,091	8	29,815
September	5	20,651	5	22,324
August	6	20,764	3	12,299
July	7	29,207	5	18,641
June	5	17,954	3	8,355
May	7	25,057	6	20,806
April, 1926	8	28,449	5	23,480

Portland, Oreg.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1927	29	102,736	39	134,127
December	34	131,426	56	213,861
November	34	135,455	48	178,820
October	41	151,013	59	217,745
September	33	126,772	56	201,152
August	40	150,609	46	167,419
July	24	93,977	33	127,270
June	22	77,850	45	156,103
May	35	128,351	43	152,890
April, 1926	17	66,789	29	107,892

Baltimore

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1927	117	362,553	126	361,277
December	245	722,141	269	783,058
November	292	818,707	298	853,723
October	271	791,999	261	783,263
September	230	678,127	224	670,465
August	228	672,453	221	639,677
July	211	644,261	202	603,648
June	138	402,230	132	371,781
May	120	369,729	121	365,443
April, 1926	107	330,401	110	326,649

Norfolk and Newport News

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1926	216	636,483	254	781,545
November	184	527,290	281	782,914
October	252	683,297	307	850,828
September	252	705,604	281	766,503
August	188	545,861	255	733,837
July	267	727,374	309	854,305
June	78	215,803	171	502,701
May	40	107,858	140	368,515
April	21	45,875	126	305,549
March, 1926	22	40,160	140	395,033

Savannah

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1927	39	.....	34	96,410
December	38	107,763	36	104,445
November	40	97,689	33	102,822
October	50	115,821	39	98,521
September	46	120,271	42	113,706
August	42	97,563	30	76,030
July	33	88,673	27	71,040
June	43	106,733	36	95,000
May	36	96,175	32	85,198
April, 1926	37	104,323	36	105,821

Key West

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1927	89	116,112	89	119,191
December	92	113,985	87	104,448
November	97	116,965	97	115,032
October	78	92,987	79	96,718
September	81	91,321	80	88,844
August	84	98,702	87	99,362
July	78	86,124	77	86,323
June	94	110,100	94	108,581
May	114	126,089	109	120,597
April, 1926	88	101,331	88	99,227

Mobile

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1927	96	224,819	83	191,752
December	82	164,129	82	174,618
November	90	200,301	83	182,839
October	98	213,430	99	211,785
September	84	179,225	75	165,838
August	89	166,164	81	158,197
July	86	153,642	84	159,256
June	89	168,610	89	163,818
May	99	183,795	95	191,442
April, 1926	109	205,035	98	178,025

Seattle

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1927	53	233,914	47	192,233
December	42	176,065	54	201,988
November	63	234,742	54	231,343
October	56	236,587	55	230,412
September	54	219,623	58	233,320
August	53	229,111	48	206,042
July	35	146,670	31	126,407
June	39	165,989	42	181,090
May	39	159,755	44	163,718
April, 1926	51	215,641	47	191,161

New Orleans

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1927	240	697,039	244	712,284
December	259	745,636	266	755,204
November	253	731,871	238	685,253
October	236	673,606	250	721,608
September	226	620,095	240	666,778
August	275	764,464	256	721,654
July	263	716,066	270	739,005
June	255	658,385	221	665,960
May	287	753,621	284	772,138
April, 1926	248	626,277	296	694,673

Charleston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net. tonnage	—Clearances— No. ships	Net tonnage
January, 1927	33	96,054	31	77,315
December	33	94,427	39	102,724
November	39	114,449	39	103,266
October	11	32,323	15	40,127
September	22	65,872	34	98,447
August	24	64,334	20	51,505
July	13	37,020	13	33,908
June	8	27,095	10	30,601
May	5	18,821	10	20,514
April, 1926	11	37,459	12	27,166

Galveston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1927	47	146,318	97	318,609
December	56	147,040	103	302,474
November	64	180,917	118	359,948
October	47	112,816	118	352,203
September	52	139,219	127	368,302
August	55	129,477	131	389,432
July	60	164,241	116	352,290
June	53	119,497	72	185,444
May	28	65,578	61	180,449
April, 1926	37	87,356	82	216,312

Los Angeles

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1927	137	420,426	138	381,692
December	155	438,464	123	386,004
November	184	439,736	138	337,937
October	187	448,038	155	421,807
September	151	406,314	211	386,789
August	143	458,240	151	399,349
July	127	460,296	103	352,367
June	123	349,936	88	244,187
May	133	376,720	112	351,123
April	149	434,866	130	370,158
March, 1926	139	371,793	128	305,105

San Francisco

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1927	133	497,560	141	522,806
December	....	520,962	.....	500,347
November	128	543,103	139	512,671
October	145	532,024	153	575,263
September	170	568,323	156	561,513
August	169	580,310	111	466,346
July	160	523,527	102	495,849
June	142	561,774	100	419,036
May	154	605,068	116	428,814
April, 1926	155	583,821	167	602,680

Port Arthur

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1927	22	57,644	28	84,531
December	25	72,885	31	100,184
November	25	67,293	31	96,171
October	19	53,558	23	71,270
September	15	43,874	22	72,960
August	19	63,639	24	71,545
July	25	79,464	32	96,637
June	22	70,743	30	97,056
May	20	60,276	36	95,754
April	32	95,592	38	108,922
March, 1926	28	87,715	37	101,830

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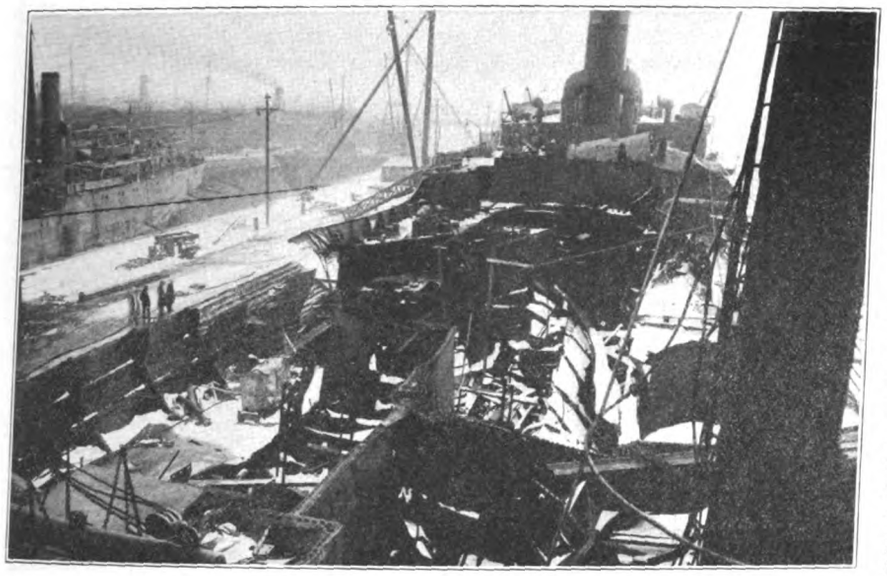
Rebuild Wrecked Tanker



AGWISUN after devastating explosion moved into drydock at Robins

THE tanker AGWISUN, sunk during an explosion in Brooklyn last year, was raised Jan. 22 and towed to the Robins plant of the Todd Shipyards Corp. to whom the contract for the repairs has been awarded. The accompanying illustrations show the completely shattered condition of the vessel.

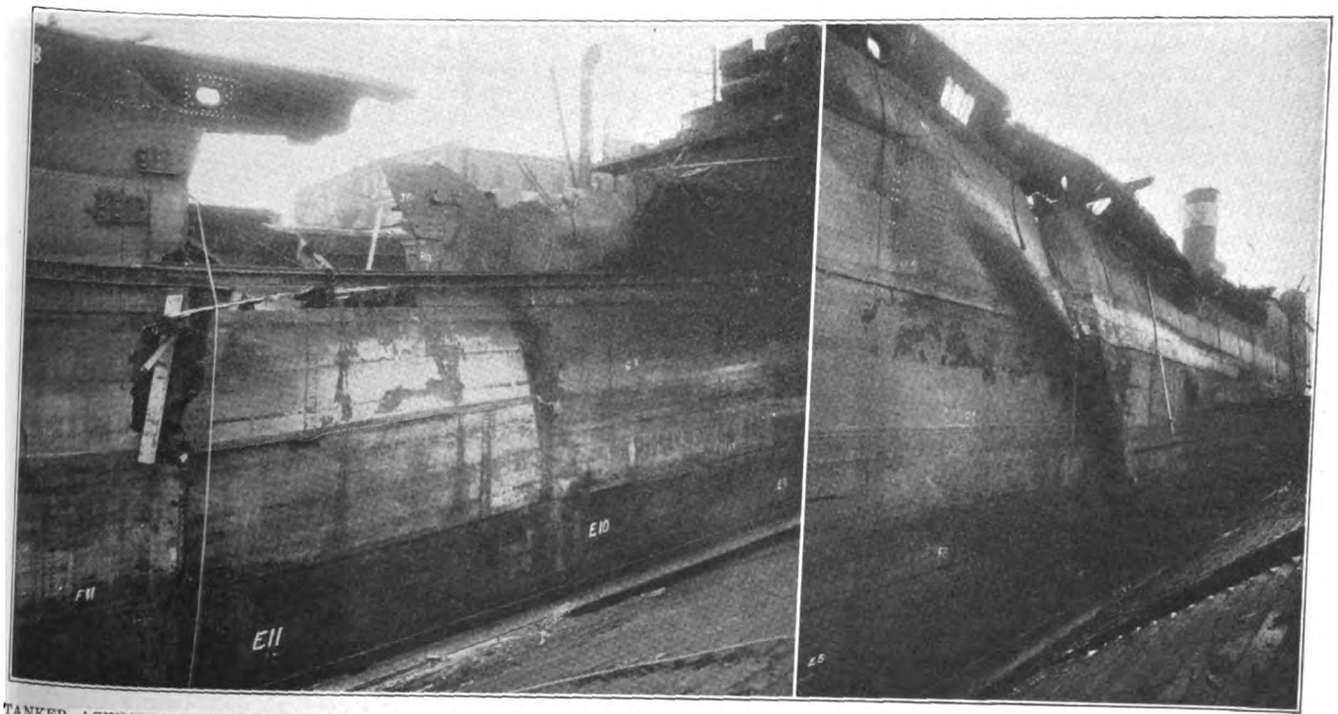
Surveys developed that the entire ship, from amidships quarters to the boiler room casing aft, had been practically destroyed. The back of the vessel was broken and she was drawing 13 feet forward, 19 feet aft and 24 feet amidships. Temporary repairs had to be made before it was possible to move her.

To float the vessel to a draft that would permit her to be dry docked was unusually difficult, as it was feared that, owing to her weakened amidships section, should she be pumped out too far amidships she would crack and break the other way, dropping her stem and stern deep down and leaving amidships light. To prevent this, heavy steel hawsers were stretched from her forecastle head, over the bridge, to the poop deck and a heavy channel was secured on the right over the break.

Huge gaps in the tanker's sides were covered with heavy rope mats and canvas wedged under steel wires that had been stretched for the purpose. These patches were necessarily flexible to permit the working of the ship as she was pumped out.

These precautions permitted the successful raising of the vessel to about a 16-foot depth and then a favorable tide was awaited to place the AGWISUN in the graving dock. To insure her passing safely through the entrance of the dock, two large steel pontoons were placed under her after quarter, one on the port and one on the starboard side. Each pontoon had a lifting power of 50 tons. Supplementing this, a floating derrick was alongside lifting on a sling under the stern frame arch.

Cribwork was ready on the drydock floor and the tanker settled down straight and true, ready for the skill of the ship surgeons that will make her ready for sea again within four months of the time she was raised. The AGWISUN is owned by the International Shipping Corp. and will when completed be in every respect practically as good as new. The contract price for the work is said to be about $475,000.



TANKER AGWISUN IN DRYDOCK—AT LEFT—STARBOARD SIDE—SHIP LITERALLY SHATTERED BY EXPLOSION—VERTICAL TEAR ENTIRE DEPTH—AT RIGHT—PORT SIDE—PLATES BADLY BUCKLED BY TERRIFIC FORCE OF GAS EXPLOSION—TO BE REBUILT IN FOUR MONTHS FROM JAN. 22

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Personal Sketches of Marine Men

S. Wiley Wakeman, Vice President, Bethlehem Shipbuilding Corp.

By H. R. Simonds

SHIPBUILDING, according to the best American practice, has been for nearly 30 years his daily concern.

HE COMBINES the knowledge of the trained engineer with a natural ability to organize and manage.

HIS experience and forcefulness will now be directed to the proper management of both sales and production.

THE waters of Long Island sound gave Samuel Wiley Wakeman his first interest in marine affairs. He was born and brought up in Bridgeport, Conn., and during his early days spent much of his time on the water. It was therefore quite natural, on entering Cornell with the class of 1899, that he should try out for the freshman crew. He was elected captain, and later rowed on the Cornell varsity crew for three years. He took the mechanical engineering course, but specialized in marine engineering, and took an ever increasing interest in marine affairs.

After his graduation he went direct to the plant of the Newport News Shipbuilding & Drydock Co. In 1900 he accepted a position with the New York Shipbuilding Corp., Camden, N. J., and for 14 years came in close touch with every phase of shipbuilding. He was interested in the construction of many of our government ships, including the battleships WASHINGTON, MICHIGAN, OKLAHOMA, KENTUCKY, MISSOURI and others, as well as the destroyers which the company built. His ability to organize and manage was quickly recognized, and not only at the New York Shipbuilding Corp. plant, but at other plants as well. When he left, in 1916 he had become assistant general manager of the yard.

J. W. Powell, who at that time was associated with William Cramp & Sons Ship & Engine Building Co. at Philadelphia, had met Mr. Wakeman, and knew of his ability. When Charles M. Schwab took over the Fore River Shipbuilding Co. in 1914, he placed Mr. Powell in charge, who in turn selected S. Wiley Wakeman as general superintendent. Mr. Powell later was appointed vice president of the Bethlehem Shipbuilding Corp., and Mr. Wakeman succeeded him as general manager of the Fore River plant.

During the war Mr. Wakeman met his many responsibilities with exceptional forcefulness and skill. It was under his direction that a large boiler plant at Providence, R. I., and a turbine plant at Buffalo were purchased. These plants then came under his operating direction. At this time also was built the large destroyer plant at Squantam, Mass., by the Aberthaw Construction Co., and Mr. Wakeman became manager of the plant when it was completed. All three of these plants under his direction were used exclusively for the construction of destroyers and their machinery.

Since the war Mr. Wakeman has made an excellent record in securing outside work for the Fore River yard, and in keeping the operating efficiency at a high point. One of his particularly outstanding characteristics is his insistance on keeping the grounds and shops of the various plants in the most meticulous order and cleanliness. He abhors slovenliness and believes that it is synonymous with inefficiency.

His appointment as vice president of the Bethlehem Shipbuilding Corp., on Nov. 1, 1926, was made for the purpose of consolidating the activities of the East coast yards, in order to simplify their operation, and to bring about closer co-operation between the various units of the corporation.

During all his years of business activity, Mr. Wakeman has held his love of outdoor life and exercise. He lives two miles from the Fore River plant at Quincy, Mass., and makes it a point to walk back and forth from work whenever he is not getting sufficient exercise oth-

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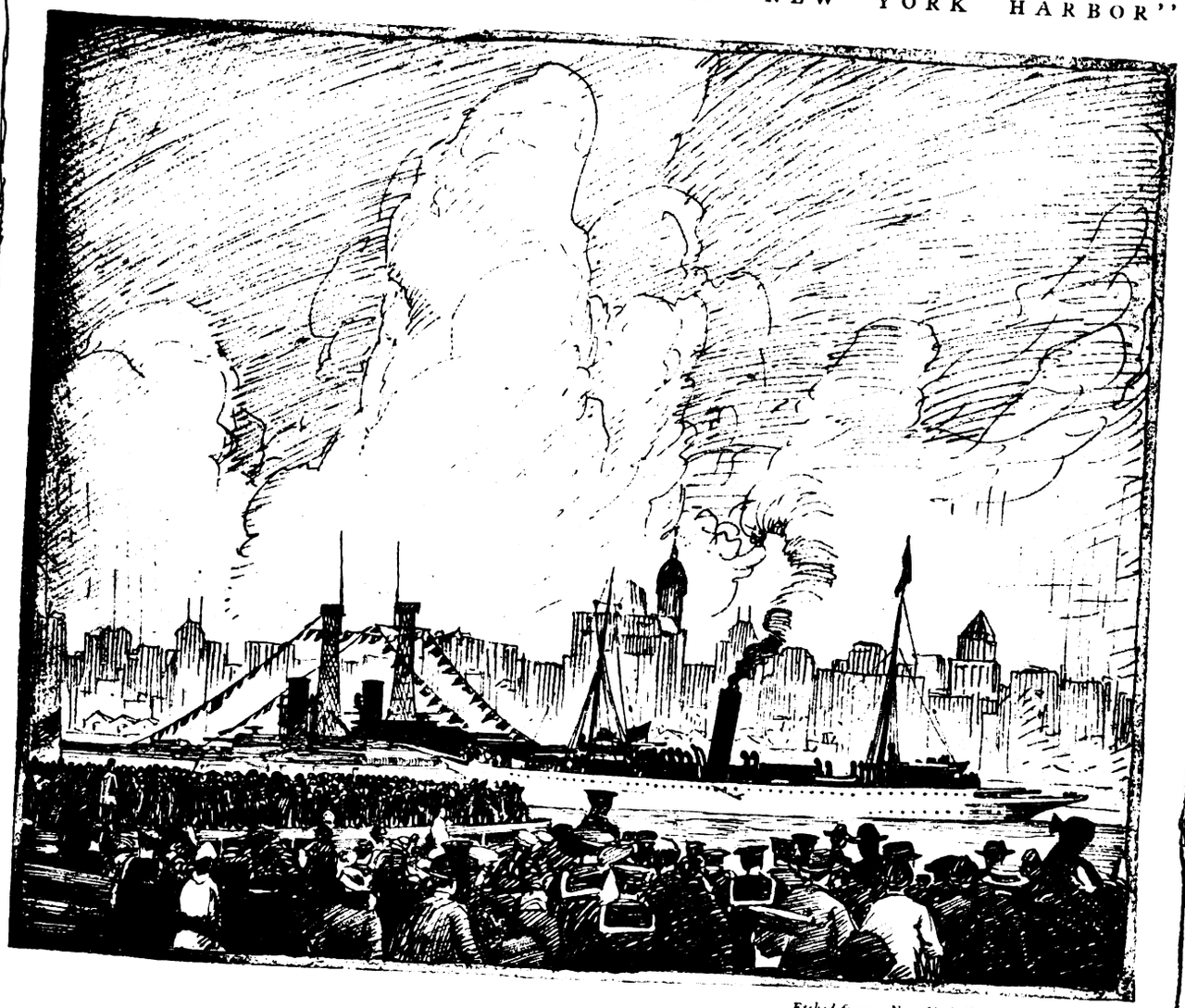
"OVER 65 YEARS IN SERVICE IN NEW YORK HARBOR"



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THE PRESIDENT'S YACHT "MAYFLOWER" PASSING THE U. S. BATTLESHIP "WYOMING" DURING THE NAVAL REVIEW IN NEW YORK HARBOR, MAY 1915

MORAN Service has been a reliable, trustworthy factor in marine activities in New York Harbor since 1860...The responsibility of handling transatlantic and coastwise vessels for representative owners and operators has been entrusted to this organization for three generations.

Long distance and coastwise towing is another important part of the activities of this company with a record of accomplishment unsurpassed.

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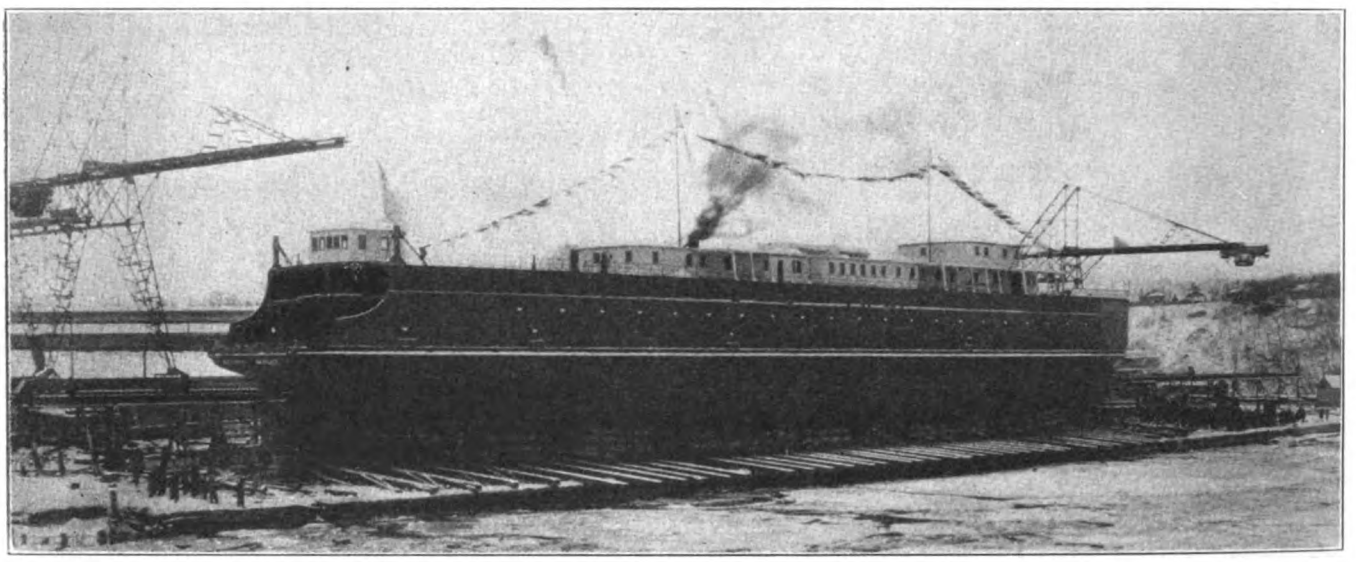
erwise. He is a golf enthusiast, a ski jumper, and an ardent tramper through hills and woods.

During the days spent at Newport News, S. Wiley Wakeman had as a pal another recent Cornell graduate, C. D. Hubbard. One day these two boys met the two charming daughters of a retired sea captain. One daughter is now Mrs. S. Wiley Wakeman, mother of a thirteen-year-old girl, and two sons, who are attending Cornell. The other daughter is the wife of C. D. Hubbard, who heads the Boston office of the Bethlehem Shipbuilding Corp. taking care of the New England activities.

Mr. Wakeman has many interests outside of shipbuilding, among which are the following: Trustee of Cornell university; trustee of Thayer Academy, South Braintree, Mass.; president and director, United States Mutual Liability Insurance Co.; vice president, Society of Naval Architects and Marine Engineers; committee member, Lloyd's registry of shipping; director, University club, Boston; director, Algonquin club, Boston; and director, Wollaston Golf club, Wollaston, Mass.

Launch Second Carferry at Manitowoc



Carferry Madison building at Manitowoc for the Grand Trunk railway just before launching Jan. 19, 1927

IN PRE-PROHIBITION days by common consent there was only one appropriate christening fluid. But times have changed and it is not unusual to find just plain water being used. But in all the history of shipbuilding it is probably safe to say that milk was used for christening for the first when the carferry MADISON was launched at Manitowoc on Jan. 19. There is a reason for the apparent importance of milk in this case. The new carferry representing a very large investment would probably not have been needed had it not been for the great importance of the dairy industry to the state of Wisconsin. The gross income of Wisconsin farms in 1925 was $390,000,000, 49 per cent of which was from the sale of milk and cream.

This vessel is the second carferry under construction within the year at the Manitowoc Shipbuilding Corp. for the Grand Trunk railway system. Miss Marion M. Dixon of Chicago, daughter of George W. Dixon a director of the Grand Trunk system was the sponsor. A large delegation of visitors from Milwaukee, Chicago, Grand Rapids, Benton Harbor and Detroit was present, including officials of the Grand Trunk railway system and Canadian National railway from Montreal and Toronto. Luncheon was served to about 300 guests of the shipyard at the Elks club.

The carferry MADISON is the second vessel of its type built at Manitowoc for the Grand Trunk railway system, the first ferry the GRAND RAPIDS, launched Oct. 23, and delivered before the end of the year, is now operating in the transport of railway cars across lake Michigan between Benton Harbor and Milwaukee. When the MADISON is placed in service the Grand Trunk system will have in operation four vessels on this run. The two new carferries are sister boats, 360 feet long, with a beam of 56 feet, and a depth of 21 feet 6 inches. Four scotch marine boilers furnish steam for two triple expansion engines, directly connected to twin propellers. The deck of the ferry has four sets of tracks to accommodate thirty of the largest type of freight cars. These ferries are designed for heavy winter service and extreme ice conditions.

MISS MARION M. DIXON
Sponsor at Launching of MADISON

Construction of both of these two carferries, the GRAND RAPIDS and the MADISON was carried out under the general supervision of Capt. Charles E. McLaren, manager of carferries for the Grand Trunk railway. Capt. McLaren's offices are in Milwaukee. H. W. Ploss of Milwaukee is the general agent in the freight department.

The plant of the Manitowoc Shipbuilding Corp. located on a pensinsula 35 acres in extent almost completely surrounded by navigable water, is particularly well situated both for

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For complete information regarding freight or passenger services consult "Schedule of Sailings", a comprehensive publication issued by the Traffic Department, or write direct.

"Americans Ship on American Ships"

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United States Shipping Board Emergency Fleet Corporation

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ship repairs and new shipbuilding. Ships have been built at Manitowoc since the early fifties, but it was not until 1902 that steel construction began to replace that of wood. At the present time the Manitowoc company employs about 1300 men. For many years the company has designed and built freight and passenger vessels, carferries, fireboats, sand suckers, tugs, lighters and dump scows. Two large carferries have been designed and constructed for the Pere Marquette railway, one for the Ann Arbor railroad for operation on Lake Michigan and another for the Wabash railway for operation on the Detroit river, all within the last few years.

Reviews of Late Books

Mainsprings of Men, by Whiting Williams; cloth, 313 pages, 5 x 8 inches; published by Charles Scribner's Sons and furnished by MARINE REVIEW, Cleveland, for $1.50 postpaid, and in Europe by the Penton Publishing Co., Ltd., Caxton House, London, for 7s 6d, net.

The author spent several years in working in shipyards, coal mines, steel plants and in other places where semi-skilled labor is employed, both in the United States and Europe, for the purpose of ascertaining the working man's viewpoint of his job and the condition under which he labors. The book is divided into three general parts: What the worker wants, what all of us want, and finding out what we want in our work. Interesting conclusions are drawn and many theories are expounded at length. The fact is stressed, and perhaps over-stressed, that the worker cares more about his job and the social prestige that can come from it than he does about the actual amount of money earned.

Another interesting conclusion set forth is that workers can be found for monotonous jobs on repetition work where almost no mental effort is required due to the fact that such employment affords plenty of time for day dreaming. At the conclusion of each of the thirteen chapters is a number of problems put in the form of questions which are more or less theoretical. Taken all together the book makes interesting reading for any man whose attention is occupied by labor problems.

* * *

The Story of the Rotor, by Anton Flettner, from the German *"Mein Weg zum Rotor"* cloth, one vol. 110 pages, 106 illustrations, 6 x 9 inches. published by F. O. Willhofft, 68 Beaver street, New York. Furnished by MARINE REVIEW for $2.00 postpaid and in Europe by the Penton Publishing Co., Ltd., Caxton House, London for 10 shillings net.

Review by H. S. Watkins

This interesting little book, written in simple and non-technical language as far as possible, describes completely and authentically the principle and use of the rotor, and other of the author's inventions leading to it.

It contains many simple diagrams and sketches explaining the theory on which most of Mr. Flettner's inventions are based, that of the flow phenomena of currents in air and water. The book answers many questions which have been in the minds of leading engineers and people who doubted the practical use of the rotor. The results of the experiments with the rotor alone, with a model rotorship, and finally the trial trip of the converted BADEN BADEN the first large rotorship, show its advanatges and improvements in efficiency over the old sailing vessel. The further use of the rotor for windmills and wind motors is also taken up.

The book has an equal appeal to the general public and the engineer, being simple enough for the first and containing enough technical information to make it interesting for the second. It follows Mr. Flettner's original as close as any translation would permit and the reader cannot help but get the author's own story.

* * *

Superheat Engineering Data. A handbook on the generation and use of superheated steam. Sixth edition revised. (Superseding Data Book for Engineers). The Superheater Co., New York and Chicago, 1925. Bound in keratol, 4½ x 7 inches, 208 pages, 85 illustrations and diagrams, 69 tables. Price $1.00.

This handbook contains condensed data for stationary and marine steam power plant engineers and operators. A feature of the book is the index consisting of 16 pages, assuring ready reference. Superheated steam, its advantages over saturated steam, and the proper design and performance of superheaters, are briefly discussed. It illustrates superheater arrangements in practically all stationary, marine and locomotive type boilers commonly made in America. Waste heat, portable and separately fired superheaters are also shown. Brief comparative data is given as to sizes, tube sizes and arrangement of tubes for stationary water tube boilers, with illustrations. The steam tables cover pressures from below atmospheric to 600 pounds, absolute, and include properties of superheated steam from 50 to 300 degrees Fahr. superheat.

The section on piping includes information for figuring piping for handling water, saturated and superheated steam, and velocity and pressure drop of water and steam flowing through piping. In this section is included also the proposed American standards for high pressures. This book also contains engineering data on coal and oil fired boilers, which include tables of heat values for gaseous, liquid and solid fuels. Other miscellaneous data include complete conversion tables and data on bolts and screw threads, with the recent work of the American engineering standards committee, and the national screw thread commission. There are also many miscellaneous tables frequently used by steam engineers.

This book contains considerable data of great interest to the engineer, which has never before been published and every marine engineer will find it a most valuable aid.

* * *

Custom House Guide, 1926 edition, marking its sixty-fourth year of publication, 1400 pages, 5 x 7½ inches, map insert; published by Custom House Guide, and furnished by MARINE REVIEW for $5.00 postpaid and in Europe by the Penton Publishing Co. Ltd., Caxton House, London for 25 shillings net.

This book is recognized as the only authoritative and complete book of its kind. It represents exhaustive research and knowledge of customs and shipping needs and it is necessary for the efficient conduct of customs, import and export business and allied fields. The 1926 edition contains a review of the principal ports of the United States, Porto Rico, Virgin Islands, Philippine Islands and Canada giving the customs, port and trade officials, limits, descriptions, port charges, marine data and facilities of each port, in addition to a classified business directory of representative warehouse men, customs and ship brokers, exporters, importers, banks, railroads, steamship lines, agents, etc., in each port, thereby covering the entire import and export field.

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The Reason for Leadership

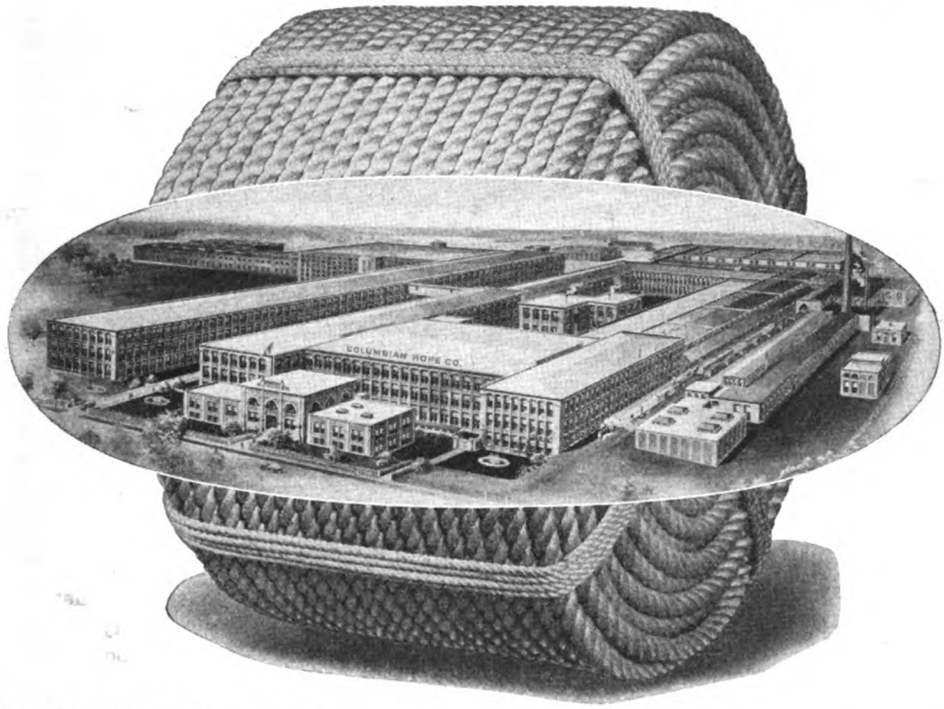

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TABLE VI

Other Vessels of Merchant Type in Operation

(Vessels so designated built by Merchant Shipbuilding Co.)

Name	Operator	Service	Total Mileage (knots)
Ala	American Diamond Line	New York & Boston to Rotterdam	340.000
Bayou Chico	Southern States Lines	Gulf Ports to Germany	352.600
City of Weatherford	Southern States Lines	Gulf Ports to Germany	261,200
Emergency Aid	Southern States Lines	Gulf Ports to Germany	282 000
George Pierce	Gulf-Brazil-River Plate Lines	Port Arthur to E. Coast S. A.	227.000
Hastings	Mobile Oceanic Lines	Mobile to Germany	282.000
Davenport	Southern States Lines	Gulf Ports to Germany	41.000
Yapalaga	Southern States Lines	Gulf Ports to Germany	66.000

NOTE:—The last two were in laid up fleet until taken out last fall to help carry cotton cargoes.

S. S. Algic Record

(*Continued from Page* 14)

ord and good condition of the S. S. ALGIC is largely due in Mr. Smith's opinion to her officers. Capt. Afred Ricca has been on this ship practically since she came out. The chief engineer G. M. Gustavson made his first trip as chief engineer on the voyage ending in New York Jan. 2, but Mr. Gustavson served for three years before that on this vessel as first assistant and therefore, has been instrumental in keeping her machinery in first-class condition and giving her a rating well over 100 per cent with the shipping board.

The S. S. ALGIC is a typical three island single screw steamship of 8800 tons deadweight. The propelling machinery furnished by the Westinghouse Electric & Mfg. Co. consists of a combined impulse-reaction cross compound turbine of 3000 shaft horsepower at 3360 revolutions per minute with a high pressure and a low pressure unit, each of which is connected to a first reduction pinion through a flexible shaft and coupling. From this point there is a second reduction to the large wheels connected to the propeller shaft. The double reduction gear is of Westinghouse flexible frame type, the pinions and gears being double helical with standard involute teeth. Speed at the turbine of 3360 revolutions per minute is reduced to 90 revolutions per minute at the propeller.

Lubrication is by gravity. The pinion dips in oil at the bottom of the frame and also receives oil from above. As the pinion revolves it splashes the oil against the gear both where the teeth come into and out of contact. The propeller thrust bearing of Kingsbury segmental type is mounted on the main gear shaft at the forward end of the gear. It is contained in a housing which is solidly fastened to the main gear housing.

Steam is supplied by three Babcock & Wilcox water tube boilers of 2900 square feet heating surface each, fired with oil burners of Schutte Koerting make. There is a Foster superheater in each boiler of 200 square feet heating surface and an induced draft system with Sturtevant fan. A complete line of main and auxiliary equipment is fitted as noted in detail in Tables I and II.

Again referring to the performance of the S. S. ALGIC. The condenser was retubed for the first time in July last year after nearly six years continuous operation. The Babcock & Wilcox water tube boilers have proved particularly dependable and the chief engineer is proud of the fact that not a single tube has had to be renewed in the seven years the vessel has been in operation. An inspection of the tubes in one of the boilers before and after turbining early in February indicated that they are in fine condition.

On her last trip the ALGIC was given a sea rating by the shipping board of 110.9 per cent and a port rating of 86.6 per cent. This is a fine record as the rating of 100 per cent is that set by the fuel conservation section of the shipping board headed by C. J. Jefferson, for a particular ship, after a careful practical study of performance of the class, as that which a capable and conscientious engineer might attain by attention to his duties, always providing weather, the failure of some part of the equipment, or carelessness in operation from the bridge does not offset his efforts. The total fuel consumption during her last voyage was 19,283 barrels of oil including both sea and port and the total distance logged was 22,013 observed miles. On her trip out the ALGIC stopped at Philadelphia, Baltiand Norfolk.

An analysis of the log for voyage No. 14, which began on July 10, 1926 and ended Jan. 2, 1927, shows that the weather was moderate 78 per cent of the time and rough the remainder. The average speed from revolutions was 10.81 knots and from observation 9.76 knots. Average revolutions per minute of the propeller were 81.15. Average fresh water consumption in tons per day was 9.34.

Lubricating oil consumption averaged 1¾ gallons per day. Only one grade, that is turbine oil is used.

Only three to four barrels of lubricating oil for all purposes are consumed on a 25,000-mile voyage and there is still on hand some of the original oil placed on the vessel when she came out. The lubricating oil is regularly purified by passing through a De Laval oil purifier. Turbine oil is used for the line shaft spring bearings with the splash ring system. No trouble of any kind has been experienced with these bearings.

TABLE VII

Performance Record—Last Voyage Tabulated of Vessels Listed in Table VI

Name	Av. Obs. Speed Knots	Fuel per Observed Mile, Pounds	Sea Efficiency	Port Efficiency
Ala	9.68	269.0	102.5	112.0
Bayou Chico	10.59	245.8	102.5	108.3
City of Weatherford	10.43	260.0	120.3	108.5
Emergency Aid	10.89	260.9	107.7	112.7
George Pierce	9.43	285.7	97.9	81.7
Hastings	10.33	259.4	107.7	114.8

NOTE: Reports on the performance of the last two vessels listed in Table VI had not been recorded at the time this table was prepared.

The average fuel consumption on the last voyage at sea was 26.02 tons or 172.4 barrels per 24 hours, or 248.7 pounds of fuel oil per observed mile. Port stops totaled 85 days and 23 hours and the total port fuel consumption was 2295 barrels or 26.72 barrels per day.

A summary of the performance of the S. S. ALGIC is given in Table V for six voyages starting with voyage No. 9. The fuel conservation section of the shipping board which now keeps a close check on performance did not begin to function until 1924. From this time records have been kept and tabulated. The voyage figures cover the performance at sea

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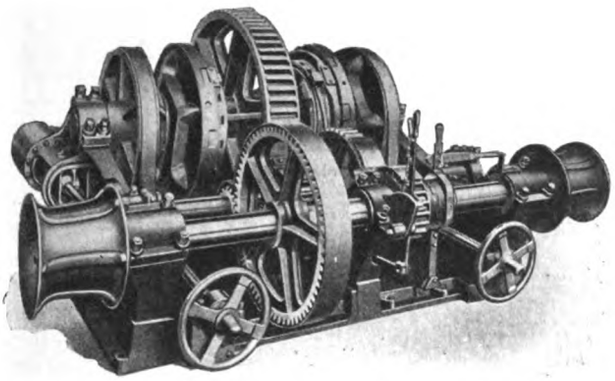

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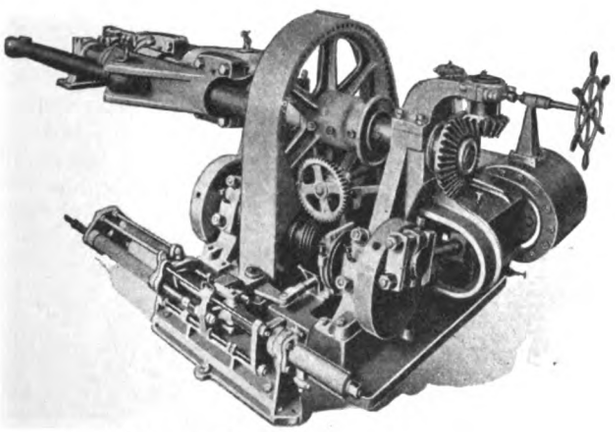

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ADEN, ARABIA—S. S. ALGIC BUNKERS OUTWARD BOUND HERE AND SAVES CANAL TOLLS

from the time the vessel leaves New York until her return. Any trips of less than 48 hours duration at sea are not included in making up the efficiency figures. In Table V it will be noted that there is a variation of from 8 days to 6 weeks between the dates of return to the United States and the start of the next voyage. This is the time spent at ports in the United States and is subject to wide variation as sometimes the ship will discharge and load cargo in New York while at other times a trip may be made to Philadelphia, Norfolk, Baltimore and return to New York. Time required for inspection, drydocking etc., also comes within these dates.

In considering the performance of the S. S. ALGIC the peculiar conditions of the run must be taken into account. Perhaps there is no other shipping board trade route on which it is so difficult to attain a high efficiency rating. A long portion of the voyage is in the Mediterranean sea, Red sea and Indian ocean where the high temperature of the water makes it impossible to maintain a good vacuum. This vessel does not have soot blowers fitted to the boilers and blowing soot by hand is out of the question in an extremely hot climate particularly for instance, while traversing the Red sea. The ALGIC leads all other vessels under the management of the Roosevelt Steamship Co. in all-around performance, operating efficiency and low maintenance cost and she stands well up in the high ranking vessels of the entire active shipping board fleet.

The reduction gears of the ALGIC are in excellent condition, without the slightest indication of pitting and with no appreciable wear and they are probably in better operating condition now than when new as they have worn in to complete adjustment. Reports of gear inspections on others of the "Merchant type" show without exception similar good condition. This is particularly noteworthy as it must be remembered that this machinery was built during a period of rapid expansion and tremendous industrial activity during and immediately following the war. For instance, these gears were designed to use as small forgings as possible thus increasing the stress in the material over that which it would be considered advisable to use under normal conditions. The second reduction gear elements have a tooth pressure of 972 pounds per inch length of active tooth face at the designed power of 3000 shaft horsepower and the first reduction elements have a tooth pressure of 541 pounds. The gears are of the Westinghouse flexible pinion frame design, invented by Admiral Melville, and Mr. McAlpine in 1907. All Westinghouse marine gears are of this type as are all reduction gears for land installations above approximately 500 horsepower. The total horsepower of this type of gearing which has been installed in this country is about 1,180,000.

It is interesting to note that not a single ship fitted with the type of power on the ALGIC has ever had the misfortune of not being able to get into port under its own power as far as the propulsion machinery was concerned. In case of casualty to one of the units of the turbine the other is available, as steam may be taken direct from the boilers and exhaust to the condenser. Also a turbine of the reaction blading type with rotors of drum construction may suffer the loss of several rows of blading without necessarily putting it out of commission. The S. S. ALA one of the "Merchant type" owned by the shipping board has the record of towing an 8800 deadweight shipping board freighter, equipped with the usually considered reliable reciprocating engine and scotch boilers, over half way across the Atlantic in very rough weather.

An important feature in connection with the proper maintenance and care in operation of the machinery and boiler installations of vessels of the ALGIC class is the marine inspection service which both the Westinghouse and Babcock & Wilsox companies maintain in all the principal ports of the United States. A thoroughly trained expert visits each ship equipped with his company's machinery or boilers on arrival in port and is able to assist the ship engineers and the shore operating staff in giving the installation proper care and attention to keep it in good condition.

In Table VI has been listed the names, operators, service and total mileage last available, for the remaining eight vessels of the ALGIC class. In this table the S. S. DAVENPORT and YAPALAGA were in the laid up fleet for a number of years and were taken out and added to the active fleet last fall on account of the shortage of ships to carry cotton and grain due to the tonnage employed to carry coal on account of the British strike. This explains why their total mileage is so low.

DOCK AT MADRAS, INDIA, WHERE THE S. S. ALGIC TAKES ON CHROME ORE

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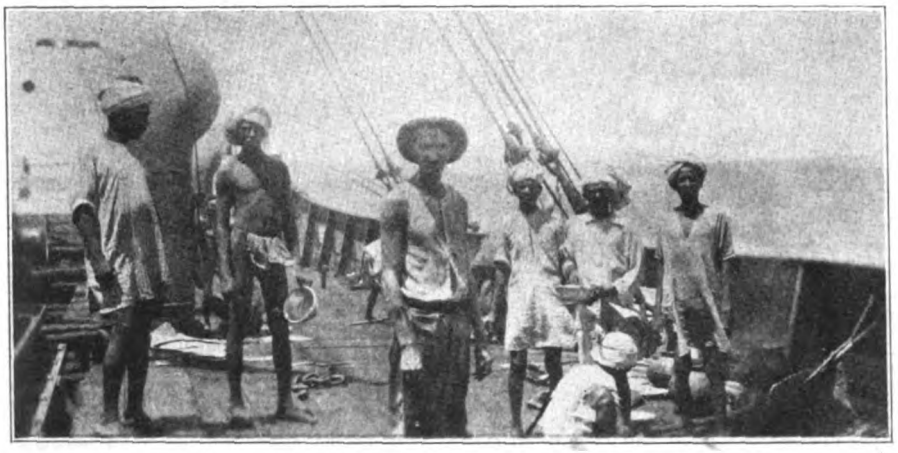

NATIVE STEVEDORES ON THE ALGIC AT COCONADA, INDIA—SHIP ANCHORS TEN MILES OFF

In Table VII performance figures are given for six of the "Merchant type" taken from the shipping board's records for the last voyage tabulated. Some of the previous voyages may not have been as good but others were better. For instance the BAYOU CHICO for her two previous voyages showed considerably better performance. The DAVENPORT and YAPALAGA are not included because the reports on these two vessels have not yet been recorded by the fuel conservation committee, although each ship has completed one round trip and is now away on the second since going into commission.

It may be interesting to give here for the S. S. ALGIC a tentative estimate of cost per month for three items which are generally considered as the basis for the prevalent notion that it is more expensive to operate under the American flag than any other. In other charges excepting first cost there should be a reasonable parity. From Table III the total wages per month at sea is $3496. Subsistence per month at 75 cents per day per man would equal $832.50. Fuel oil at sea per day on the basis of the report for voyage No. 14 would be 172.4 barrels. For 30 days at sea the amount would be 5172 barrels. At the current market prices of bunker oil in New York, of $1.815, which undoubtedly is bettered in shipping board fuel oil contracts, the cost per month would be $9387.

The total cost therefore, to operate a ship such as the ALGIC while at sea for one month for the three items, wages, subsistance, and fuel, would be $13,715.50.

Recent Sales of Ships

THE shipping board has approved the sale or reconditioning of the following government merchant tonnage:

JOHN JAY, steel single screw, steam cargo ship of 12,850 deadweight tons, designed to steam at about 10¼ knots, to D. K. Ludwig of Boston for the sum of $125,000 with the stipulation that certain repairs and alterations be made at a cost of $260,000 within a year's time. This ship is to be converted to a bulk ore carrier or tanker at the discretion of the purchaser.

AMERICA, the Emergency Fleet Corp. has been authorized by the shipping board to prepare specifications and bids for the reconditioning of this ship, severely damaged by fire at Newport News, Va. last March. This vessel is needed for operation on the United States lines, and is a cabin ship of 22,622 gross registered tons. It is expected that she may be ready for service during the summer.

CABRILLE, LILMAE, steel steam single screw tankers of 7500 tons deadweight each, equipped with reciprocating engines and scotch boilers to the Chile Steamship Co., Inc. of New York at $420,000 each. At the time of the sale the CABRILLE was laid up at Mobile and the LILMAE at Philadelphia. The contract called for delivery to the purchaser at these places.

DARDEN, GLADYSBE, steel steam single screw tankers of 7500 tons deadweight each, equipped with reciprocating engines and scotch boilers. Bids for these tankers were rejected and the Fleet corporation was directed to readvertise them for sale.

AMERICAN STAR, steel steam cargo ship, of 7564 deadweight tons, completed by the Downey Shipbuilding Co., July 1919, equipped with a triple expansion engine of 2250 indicated horsepower and three scotch boilers designed to steam at about 10¼ knots on 29 tons of oil a day. She is now laid up at New York. Offers for this vessel were received at about $125,000 and were rejected by the board. The board voted to readvertise this vessel for sale at not less than $136,000. On Feb. 15 the Fleet corporation received an offer of $127,000 for this vessel from Moore and McCormack Co. Inc. in New York which was rejected.

CHESTNUT HILL, BRANDYWINE, steel steam single screw tankers, of 7000 tons deadweight each, laid up at Mobile, Ala. Bids were received as follows: from M. & J. Tracy Inc. N. Y., $350,000 for both tankers on steamer basis or $177,500 for one vessel; from the Atlantic Refining Co., Philadelphia, $105,562.50 for both tankers on basis of conversion to diesel electric propulsion; from the Anglo Chilean Consolidated Nitrate Corp. N. Y., $57,000 for the CHESTNUT HILL or $51,000 for the BRANDYWINE on the basis of direct diesel propulsion conversion. On the basis of the above bids the tanker CHESTNUT HILL was sold to the Anglo Chilean Consolidated Nitrate Corp., N. Y. for the sum of $57,000, sale approved by the board Feb. 17. Under the terms of the sale the purchaser agrees to convert this vessel to direct diesel propulsion which involves a large expenditure. The bids for the tanker BRANDYWINE, a sister ship were rejected.

KISHACOQUILLAS, steel steam single screw tanker for the carriage of molasses of 7500 deadweight tons sold to the Dunbar Molasses Co. of New Orleans, Feb. 9, for the sum of $135,000. This firm recently purchased a sister ship the INSPECTOR for $150,000. The KISHACOQUILLAS is a converted Hog Island type tanker and is at present laid up at Mobile.

World Markets

ANGLO MEXICAN, double deck steamship, 8160 deadweight tons, 4706 gross tons, for about £30,000 to Italian buyers.

BUFORD, double deck steamship, 5500 deadweight tons, 4804 gross tons, for about $34,000 to Norwegian buyers.

CANADIAN SETTLER, single deck steamship, 5918 deadweight tons, 3548 gross tons, for about £25,000 to Japanese buyers.

CONSTANTINE, single deck steamship, 2250 deadweight tons, 1459 gross tons, for about £12,700 to Glendevon Steamship Co., Glasgow.

HUGHLI, double deck steamship, 6880 deadweight tons, 5232 gross tons, for about £30,000 to Bank Line Ltd., London.

GENERAL BOTHA, double deck steamship, 8630 deadweight tons, 4848 gross tons, for about £28,500 to Norddeutscher Lloyd, Bremen.

KROONLAND, four-deck steamship, 11,933 gross tons, for about £27,500 to European shipbreakers.

KUMARA, double deck steamship, 9050 deadweight tons, 6063 gross tons, for about £14,000 to O. W. Nordin, Paris.

TEESTA, three-deck steamship, 7450 deadweight tons, 6296 gross tons, for about £15,250 to Japanese buyers.

M. S. Unicoi's First Trip

The UNICOI, third of the board's fleet of a dozen dieselized vessels now in process of conversion, negotiated the 6539 miles from New Orleans to Venice without a stop, or in "two twists of the wrist" as Capt. Herbert Hudson, skipper, phrased it.

Captain Hudson said that he touched the lever of the ship's telegraph twice only during the voyage: once upon leaving New Orleans and once upon arriving in Italy.

The UNICOI, which is driven by Worthington two-cycle diesel engines, averaged a speed of 11.7 knots notwithstanding heavy weather. The vessel left New Orleans with a cargo of cotton, Jan. 23.

The Merchant Marine

Ships of the American merchant marine today carry annually 17,311,147 tons of cargo as compared with 201,562 tons in 1789, according to merchant marine statistics of 1926, made public by the department of commerce. The first steam vessel appeared in 1807 carrying 78 tons of cargo. Since then this class of water transportation has grown to approximately 7273 ships with a total tonnage of 14,317,777.

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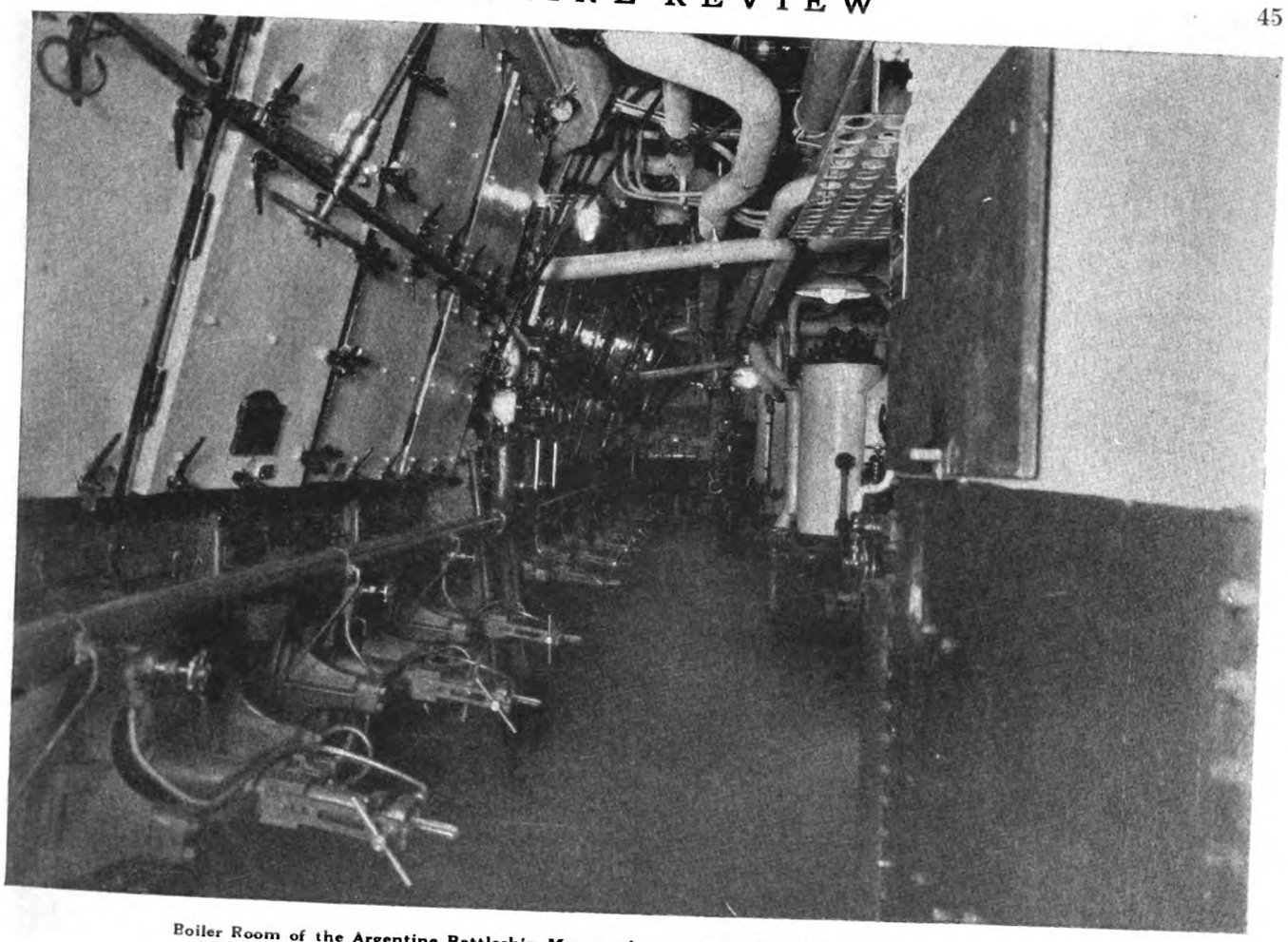

Boiler Room of the Argentine Battleship *Moreno* showing Bethlehem Dahl Oil Burner Installation.

Bethlehem Oil Burning System In Naval Service

The Battleships *Rivadavia* and *Moreno* of the Argentine Navy, recently reconditioned in our Fore River Plant at Quincy, Mass., are both equipped with the Bethlehem (Dahl) Mechanical Oil Burning System.

Repeated tests on shipboard have demonstrated the exceptionally low fuel consumption of the Bethlehem (Dahl) Mechanical Oil Burning System. A mechanical type of burner is used, which is applicable to any style of boiler, and which will burn from the heaviest to the lightest grade of fuel oil.

An adjustment enabling the operator to regulate the supply of air necessary for perfect combustion is the basis of the high fuel economy obtained with Bethlehem (Dahl) burners.

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Launch Day Liner

(*Continued from Page* 15)

service. By this change passengers on the third deck will be saved the inconvenience caused by constant moving through the saloon of all those using the second deck. The private parlors will be tastefully furnished with wicker, and will be adorned with artistic and pleasing rugs. Each parlor has a lavatory.

The finishing and decoration of the PETER STUYVESANT will be harmonious and elaborate. An unusual proportion of the steamer's interior will be finished with mahogany, the lighter tones predominating. All window frames, door frames and much paneling will be of this material.

Oil paintings depicting the life and times of Peter Stuyvesant now are being executed by Herbert W. Faulkner at his studio in Washington, Conn. Mr. Faulkner is a distinguished artist in oils. His murals and other paintings on the ALEXANDER HAMILTON and the DEWITT CLINTON of the Day Line have been admired by thousands of travelers.

The PETER STUYVESANT a single screw steel steamer will be equipped with four Babcock & Wilcox water tube boilers fitted with oil burners of the Peabody type, and arranged for forced draft. The main engine will be a four-cylinder triple expansion, surface-condensing engine, balanced on the Yarrow-Schlick-Tweedy system, and designed to develop 2800 horsepower at 125 revolutions per minute. The cylinders are 25 x 40 x 47 x 47 inches in diameter by 36-inch stroke. All the usual auxiliaries are provided, including three generating units to furnish current for lighting, motors and refrigeration. The steamer will have one stack.

"Our choice of the name of Peter Stuyvesant for this new steamer was determined by the unique and picturesque character of this governor of the Dutch colony of New Amsterdam, and because of the imprint he has made on the history and traditions of New York and the Hudson river," said Mr. Olcott, president of the line.

"Peter Stuyvesant was the most noted of the Dutch governors. His administration began on May 29, 1647—two hundred and eighty years ago this spring. He came into power at a turbulent and dangerous period when the colony was threatened from without and harrassed from within. He led his little armed force against its enemies and ruled his realm with a strong hand. In 1664 the English compelled him to cede his territory and he returned to Holland, but came back to New Amsterdam upon an overturn of the colony, and again ruled it briefly. After his second term of official service he retired to his own property on the "bouwerie" in New York City where he remained until his death in 1672. He was born in 1592, the son of a Holland clergyman and lost his leg in battle on the island of St. Thomas. His body still lies in the Stuyvesant family vault beneath the church of St. Marks In-the-Bouwerie, Second avenue at Eleventh street, New York City."

Water from a spring on the state reservation at Saratoga, sent by Governor Smith was used for the christening of the PETER STUYVESANT. The governor of New York also sent the following letter to Mr. Olcott:

"The state of New York is glad to officially participate in the launching of your new steamer, the PETER STUYVESANT. As the jurisdiction of Governor Stuyvesant in those years of long ago extended into the territory now comprising the state reservation at Saratoga Springs, it is with real pleasure that I am causing to be sent to you, by messenger, from one of the state's natural mineral springs a specially filled bottle of Saratoga geyser water to be used for the christening of the PETER STUYVESANT, the steamer which I hope will serve the public for many years for the pleasure travel on our historic Hudson river."

Machinery and Shipping

By M. B. Lambert

THE rapid development of American industry is attributed to the use of modern power driven machinery. It is estimated that there is approximately 3¾ horsepower per worker in operation in our industrial plants, whereas the average in European countries is approximately 1¾ to 2 horsepower. The widespread use of power driven machinery was made possible by the rapid expansion of electric power distribution.

Many of the modern cargo carrying ships embrace problems in labor saving and other economies similar to that of our varied land industry problems. Shipping, however, has been the last of our basic industries to avail itself of the utmost in the use of modern engineering and machinery.

Shipping is one of the oldest industries; reliability is and always should be the paramount requirement. Land industries may experiment with more efficient machinery which the ship owner does not care to risk, but will adopt as soon as it is shown that it is reliable and is adaptable to use on ships. Hence we find numerous ships with diesel engine propulsion, diesel electric, steam turbine, steam geared turbine and steam electric propulsion as well as auxiliary electric motor drives and other modern appliance on new ships and reconditioned ships.

American ocean shipping is confronted with many difficult problems, some of which are economic. The American public has never understood the latter, especially in the interior states. Hence adequate assistance and co-operation has been withheld from the shipping interests in this country, with the result that although we are the greatest industrial nation (thanks to our natural resources, our railroads and our electric power) our shipping resources do not compare with other nations. The development and greater use of modern machinery for propulsion and cargo handling is destined to become a factor in helping to solve this problem.

Ships vary in character as do land industrial plants. Some lend themselves to efficient diesel electric drive; others have uses for steam other than propulsion and other factors which make modern higher pressure steam propulsion the most economic. This opportunity for competitive or comparative engineering study, and analysis, opens the door wide for the application of skilled engineering thought. Competitive effort between the diesel engineer, the steam engineer and the electrical engineer is bound to bring to the ship owner the same high character of engineering development that the land industries have enjoyed during recent years. It will thus become common knowledge in a few years which type of modern machinery is best for the various classes of shipping.

The shipbuilding industries and the various manufacturers who furnish machinery for shipping could with

The author, M. B. Lambert, is transportation sales manager of the Westinghouse Electric & Mfg. Co.

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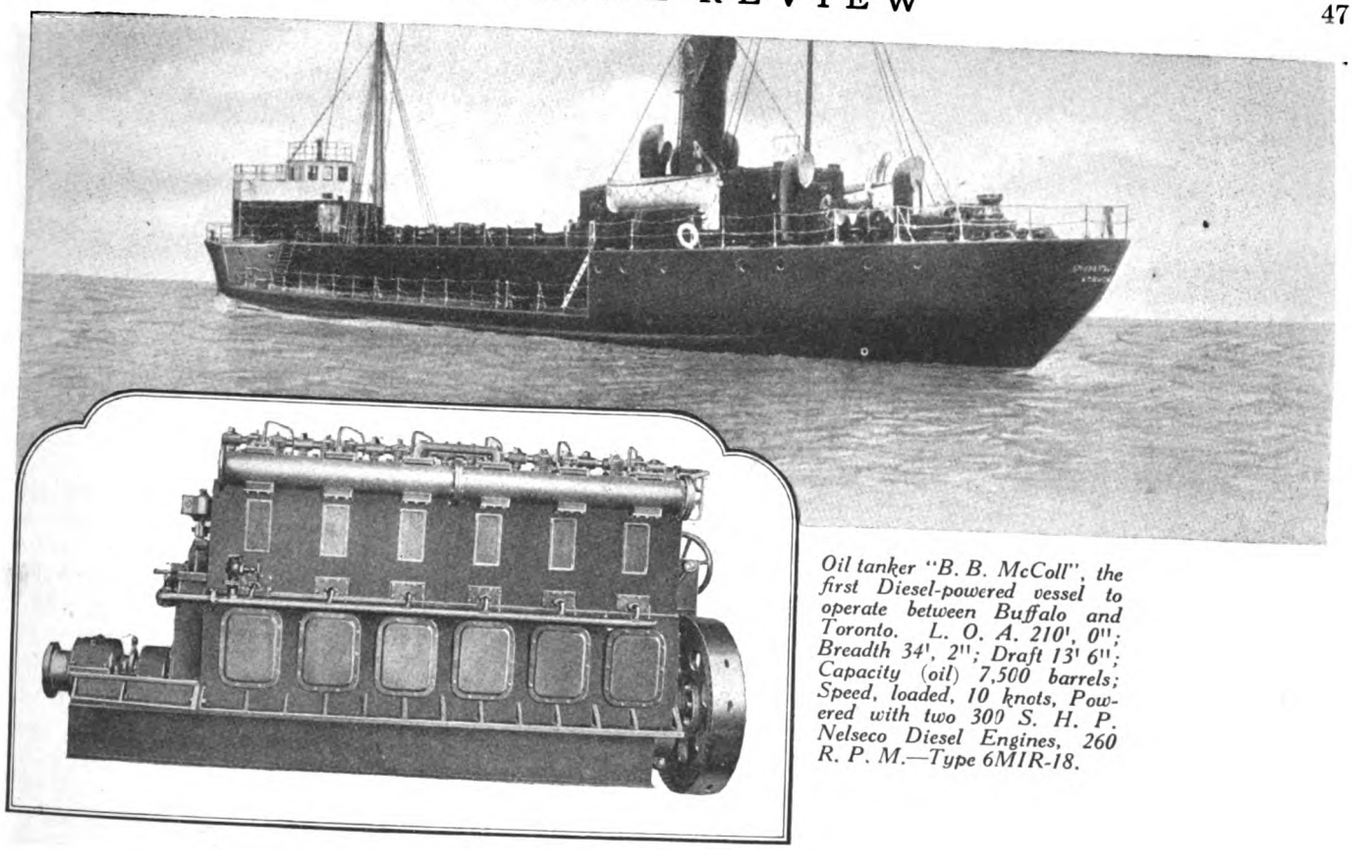

Oil tanker "B. B. McColl", the first Diesel-powered vessel to operate between Buffalo and Toronto. L. O. A. 210', 0"; Breadth 34', 2"; Draft 13' 6"; Capacity (oil) 7,500 barrels; Speed, loaded, 10 knots, Powered with two 300 S. H. P. Nelseco Diesel Engines, 260 R. P. M.—Type 6MIR-18.

"Never a moment's delay . . . "

THE following unsolicited letter is another strong testimonial for Nelseco Diesel engines. Read what these ship owners say:

The New London Ship & Engine Company
Groton, Conn. Atten: Mr. Frank T. Cable

Dear Sirs:

The Motorship "B. B. McColl" is now tied up for the winter and is being over-hauled and the preliminary report on the two new main 300 H. P. engines, which we purchased from you about 12 months ago and which were installed last winter, indicates they are in perfect condition. I have not got the figures before me, but understand this boat made during this season some 52 round trips through the Welland Canal, probably the hardest type of service that is possible, there being 20 locks in 12 miles, many of them only 300 or 400 feet apart and which calls for very severe engine operation. The ship's Log showed there was never a moment's delay of any kind on account of engine trouble and there were no replacements or anything at all necessary with the engines you installed. The lubricating and fuel oil consumption was so low that we were surprised; in fact the donkey boiler used for steering used considerably more fuel than the main engines.

This boat will again go in service at the opening of navigation between our bulk terminal at Buffalo and our refinery at Toronto and we expect to operate her indefinitely without trouble.

Yours very truly,
McCOLL BROTHERS LIMITED
J. W. McColl

Nelseco engineers will be glad to tell you about other interesting Nelseco Diesel installations. In writing ask for pamphlet M. R.

NEW LONDON SHIP & ENGINE COMPANY
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profit endeavor to co-ordinate to a greater degree their effort to acquaint the American public regarding the plight of the ocean shipping industry. It was only a decade or so ago that the steam railroads, the national electric light and power industry, and the gas industry were greatly hampered by unfavorable public sentiment and unsound regulation. Ten or twelve years ago the principal topic of the orators at their conventions was that of commiseration about their plight. The addresses and discussions were printed and mailed largely to themselves; very little reached the public for any continued period. Then came a change. Public utility information bureaus were established in many parts of the country with a competent publicity staff in charge, with the result that in a few years the whole attitude of the public mind was materially changed, simply because the public in general understood the whole public problem better.

Is it possible to do the same thing for our shipping? Could the farmer, for example, by this means be shown that the profitable disposal of our surplus agricultural products depends largely on the availability of American shipping to carry it overseas, and that private enterprise is essential to make this successful and enduring.

Build Tankers on Bracketless System

FROM the annual report of the application of the Isherwood system of framing it is apparent that Sir Joseph Isherwood's latest invention, "the bracketless system," hardly over six months' in use, has proved to be acceptable to ship owners and shipbuilders. Since the completion of the first vessel 12 contracts have been placed, making a total of 14 ships aggregating about 180,000 tons deadweight.

The first vessel built on this system, the BRITISH INVENTOR, purchased by the British Tanker Co. Ltd., and placed in service last July, proved a complete success. After two round voyages in which heavy weather was encountered examination in drydock showed no strain whatever and the results of the inspection satisfied in every respect the many experts present. The 14 tankers ordered, under construction, and completed for which this system is in use range in size from 10,000 to 21,000 tons deadweight. Contracts awarded this year for the use of the bracketless system includes a second tanker building by arrangement between Sir Joseph Isherwood and Messrs. Palmers Shipbuilding & Iron Co. Ltd.; four large vessels by Scandinavian shipbuilders; two by French shipbuilders for the Compagnie Auxiliaire de Navigation of Paris; one 21,000-ton tanker for the Standard Oil Co. of New Jersey, and three to be built in British yards, two of the latter being for the Imperial Oil Co. Ltd. of Toronto, Can.

The usual Isherwood system is also being used in many cases by ship owners who have already used this system. Among the orders for the Isherwood system are three light draft tankers for transporting oil from Maracaibo to the Caribbean sea to be discharged into ocean going ships; a 13,000-ton tanker work on which was recently begun at the Sun Shipbuilding Co., Chester, Pa.; a passenger cargo vessel of finest type for the Southern Pacific Co. at the Federal Shipbuilding Co.; and others.

From an analysis made by the Isherwood company the bracketless system or the Isherwood system has been adopted since the invention of the original system in 1907 in 661 general cargo vessels, colliers, ore steamers, passenger vessels, great Lakes freighters, and passenger and freight and ferry vessels aggregating 5,888,830 tons deadweight; 747 oil tankers aggregating 7,128,060 tons deadweight; 143 barges, dredges and trawlers aggregating 79,590 tons deadweight. From September 1907 to December 1908, six vessels of 31,608 deadweight tons adopted the Isherwood system. Nineteen years after for the year ending 1926, 1551 vessels aggregating 13,096,480 deadweight tons had adopted the Isherwood or the new bracketless system of construction originated by Sir Joseph W. Isherwood, Bt.

Order Diesel Engines

The Standard Oil Co. of California recently placed an order for four 1000-horsepower diesel engines with the Busch Sulzer Co., St. Louis. These engines are two cycle, of trunk piston with eight cylinders, operating at 275 revolutions per minute. They are each rated at 1100 brake horsepower for a continuous five-day period. The engines are to be used in the conversion of the tanker DISTRICT OF COLUMBIA to diesel electric drive. This is the largest marine power plant of this type actually ordered up to the present time. The DISTRICT OF COLUMBIA was purchased from the shipping board under agreement to convert to diesel.

New Vessel Inquiry

The Standard Transportation Co., the steamship operating division of the Standard Oil Co. of New York is inquiring for three vessels. According to reports concerning the steel each one of these vessels calls for 3600 tons of plates and 1800 tons of shapes. The projected vessels, presumably tankers, will therefore be of considerable size.

Launch Self Unloader

A steamer for service on the Great Lakes of North America and on the St. Lawrence being built to the order of Mr. Playfair of Midland, Ontario, for the Valley Camp Coal Co., Ltd., was launched from the Neptune shipyard of Swan, Hunter & Wigham Richardson Ltd., on Feb. 1.

The vessel will carry coal and is of special interest because she is the first vessel to be built in England fitted with special self-unloading gear, by means of which she will be able to discharge her cargo, whether coal, stone, coke or any other similar material, at any suitable position on the quay or into trucks. The particular gear being fitted in this vessel is that of Leathem D. Smith who has recently installed similar gear on other boats on the Great Lakes.

The vessel is nearly 260 feet in length, 43-foot beam and will carry over 2000 tons deadweight on a draft of a little over 14 feet. She is built to attain the highest class in the British corporation for the survey and registry of shipping for service on the Great Lakes.

She will have triple expansion engines fitted aft, and will be of the usual lake type, having navigating bridge forward and a large number of hatchways for ready working of the cargo.

The steamer will be fitted with steam steering gear, electric light, steam heating, three mooring winches, steam windlass, refrigerating plant etc.

The vessel was named KINLOCH, the naming ceremony being gracefully performed by Mrs. Dear of London.

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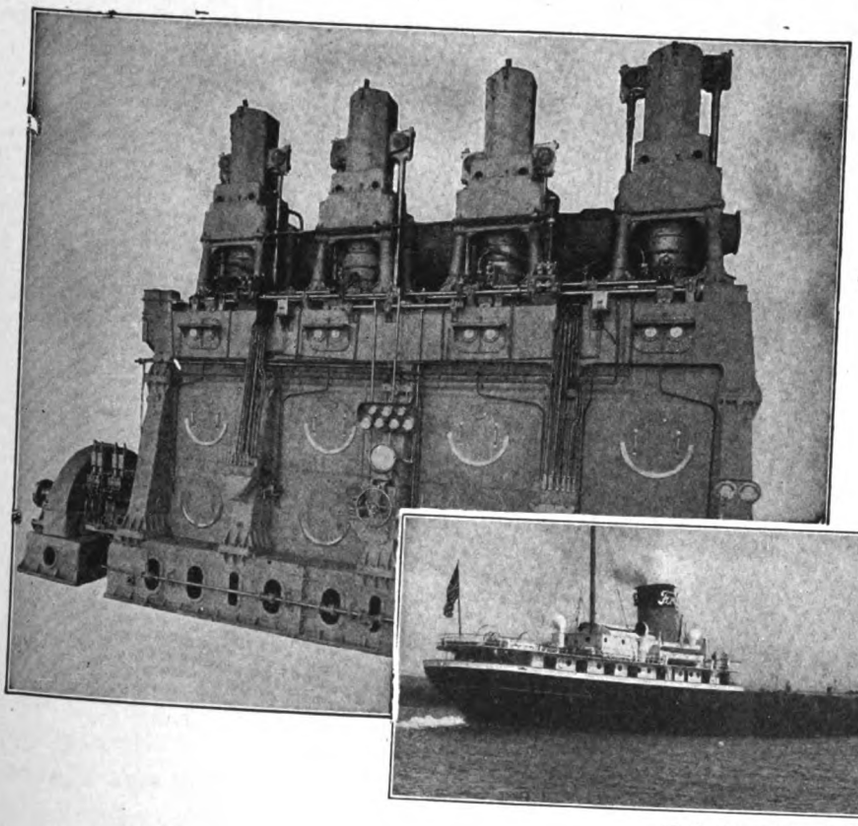
SUN SHIPBUILDING & DRY DOCK COMPANY

Builders of

SUN-DOXFORD DIESEL ENGINES

The Engines that Power

"HENRY FORD II" *and* "BENSON FORD"



3000 S. H. P. Sun-Doxford Diesel Engines power the two motorships, "Henry Ford II" and "Benson Ford".

M. S. "Henry Ford II"

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Reduce Fuel Bill

(*Continued from Page 24*)

This now brings us to the consideration of the subject of auxiliaries which, as is quite generally understood, embraces sundry units either attached to the main engine or independent of it and in the latter event usually steam operated. Of these the most important is the air pump.

Down to the middle and late eighties this unit, together with the feed pumps, bilge pumps and cold water pumps, were invariably attached to the main engine. Those who are well informed or whose experience has been sufficiently broad are aware of the circumstances attending the birth of the independent air pump and condenser in particular. About that period a considerable number of noncondensing engines were being converted to compounds and the independent unit offered in some instances a solution of an otherwise awkward, and frequently difficult, problem. They were also employed in conversion of simple noncondensing engines to condensing. An impression gained ground that by relieving the main engine of air-pump duty a material increase in revolutions, or a saving in fuel, would follow, and the practice soon extended to new ships as well. Nothing that engine builders could do or say would convince purchasers to the contrary. This was partly due also, no doubt, to the fact that certain new ships had developed considerable trouble with attached pumps.

Independent Auxiliaries

Probably at this time little accurate knowledge existed among operating engineers as to the actual power absorbed by attached air pumps and the idea was attractive and made rapid headway for a time. With the air pump separated the other units followed and all auxiliaries became steam operated. After a time the steam cost of auxiliary services became better understood and the attached pumps again became customary with the exception of the boiler feed pump which has continued to be independent.

The power absorbed by the air pump is, in general, very greatly overestimated outside of the designing office. Indicator diagrams from a number of air pumps show that for the modern ship, with a good single-acting trunk pump, the indicated power is between one-quarter and one-half of 1 per cent of that of the main engine. Of course the indicator card does not disclose friction but even if we add 33 per cent for friction losses we find that in the modern ship of say 2400 indicated horsepower the total load of the attached pump does not amount to more than about 10 indicated horsepower. This work it is to be remembered, and the point cannot be too strongly stressed, is done by the main engine and at its power cost, say about 140 pounds of steam per hour or in the neighborhood of 15 pounds of coal.

Attached Feed Pumps

Now there is in these days no lack of data on the steam consumption of auxilaries, beginning with the tests of the auxiliaries of the cruiser MINNEAPOLIS is 1895, 1896 and 1897, and much additional and authentic data through the years since then. From these it appears not only that in no instance does the independent air pump do its work on so low a proportion of the engine power but the steam consumption varies all the way from about 90 pounds per indicated horsepower in a single pump with compound cylinders or a beam pump also with compound cylinders up to over 250 pounds with a simple duplex. Even for equal power and at the lowest steam consumption noted the independent requires more than six times the fuel to do the same work. It is to be observed furthermore that hotwell temperatures are invariably lower with the independent than with the attached pump and which is easily understandable from the fact that the stroke of the independent is never absolutely fixed and its efficiency in air extraction is thereby lowered.

The same thing is true of feed pumps. The actual work done in delivering the feed water in the ship under consideration is equivalent to about 4½ to 5 horsepower. Doing this with the main engine costs us say about 70 pounds of steam per hour or say about 8 pounds of coal. The cost of doing this with a steam pump may vary all the way from 150 pounds of steam per horsepower per hour upward, depending upon the type of pump and its condition. The power required to move the water is easily calculated within very narrow limits, but friction losses within the pump itself cannot be even estimated although every engineer knows that they are relatively very great. Steam leakage at pistons is always a factor, even when new, the more because of the slow speed at which they ordinarily work, and a test of steam-tightness would in most cases develop surprises. At least two tests of lake ships by naval engineers show steam consumptions ranging from 300 to 400 pounds per indicated horsepower per hour. They also add that the auxiliaries "showed fair economy" indicating that there was nothing exceptional or unusual about their performance. Of course these consumptions greatly exceed the quantities accounted for by cylinder volumes or the work actually done and are due to condensation and leakage, in fact, especially at slow speeds and subnormal duty, these losses represent the greater part of the consumption and, as both are variables, account for the wide variation in steam consumption disclosed by different trials.

In effect then we have for the considered ship a steam consumption of around 2000 pounds per hour for boiler feeding with the independent pump as against about 70 pounds per hour with the attached pumps. In terms of coal it means about 220 pounds as against about 8 pounds.

One of the reasons urged against the attached pumps is that they are noisy and difficult to maintain. This is possible, but there is no difficulty in the way of building attached feed pumps which will not only be noiseless but cost less to maintain than the independent. The speeds involved are low, seldom over 200 feet per minute, and the pressures in no case abnormal. Numerous examples may be quoted, some of them coming under the writer's observation, of pumps at much higher speeds and capacities working under pressures up to 1200 pounds year after year. It is also to be said that in many instances the unsatisfactory working of attached pumps is no fault of the engine builder. The substitution of independent pumps merely conceals imperfect and improper care at enormous expense to the owner. Those who make contact with oil engines have to accustom themselves in short order to attached pumps working under pressures and conditions that never faced the steam plant. In fact the question is mostly psychological.

Operating Cost of Auxiliaries

The same criticism as to operating costs applies to the whole list of independent pumps, varying in degree only. It attaches also to other auxiliaries to a lesser extent.

A further reference to circulating pump costs was intimated and therefore it may be here pointed out that the power required for circulation alone, with the centrifugal pump and with the discharge carried above the load line, is more than three times that required for the attached air pump of the jet condensing system, and with the type of engine usually

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Toledo Shipbuilding Company Inc.

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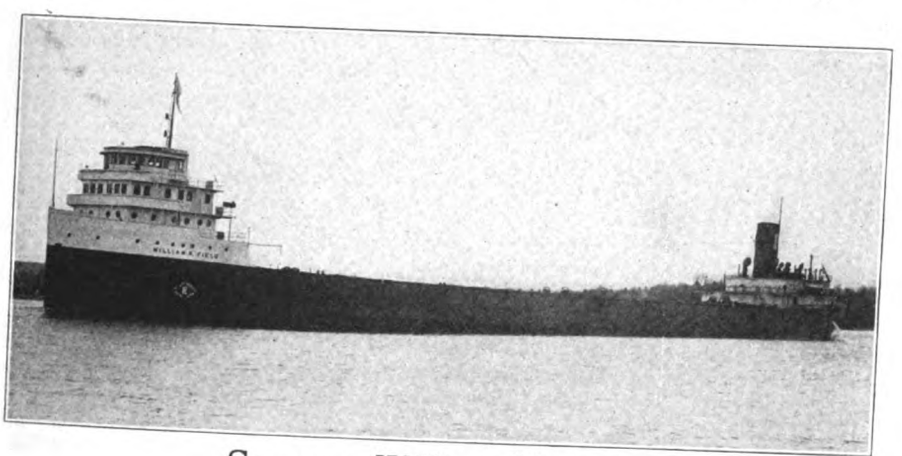
Builders of the World's Record Cargo Ship



Steamer William K. Field

604 ft. Long, 60 ft. Beam, 32 ft. Depth. Deadweight Tonnage 12000.

OVER half a million tons of freight carried—forty six cargoes of ore and coal delivered in seven months and seventeen days by the steamer William K. Field.

This remarkable performance earned her the title, "Champion Freight Carrier of the World". During the season 1924 on the Great Lakes she registered a total of 552,014 tons. *An unprecedented accomplishment!*

The William K. Field is owned and operated by Reiss Steamship Company, Cleveland, Ohio. Her type of construction permits rapid loading and discharge of cargo. This was an important factor in her record breaking performance.

Builders and Repairers of Ships and Engines

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employed costs at least eight times as much in steam, and, since an air pump or its equivalent must be supplied anyway, the comparative cost becomes about 10 to 1.

Analyzing The Auxiliaries

On the credit side there is some heat recovery in utilizing exhaust steam for heating feed water, but examination of the various reports of tests indicates that in modern ships with their multiplied auxiliaries there is no possibility of reabsorbing more than a part of the heat rejected in the auxiliary lines and this salvage is a gain only when the duty in question cannot be performed by an attached unit. It only reduces the loss; it does not avoid it or cancel it. It should be noted that without exception all the best performers in Table II and Fig. 1 carry jet condensers with attached auxiliaries, although in some of them the feed pumps are independent.

There are a number of such services however and the list tends to expand year by year as new services are demanded. The whole subject of auxiliaries can be stated thus:

(a) What are indispensable?

(b) Of these which can be attached to the main engine?

(c) What is the most economical method of operating the remainder?

Question (a) is for the owner to decide. He is the sole judge and must determine what services he wants to provide and pay for, bearing in mind that the first cost is only the beginning.

Question (b) is not difficult and indicates the services which are required in connection with the main engine operation or for the performance of which the main engine can be availed of for the same covered by such operation. These embrace the air pump, the feed pumps, bilge pumps, cold water service for engine room, forced lubrication pumps, if used, and quite possibly others.

Question (c) is much easier to answer today than even a few years ago. The development of electric motors and motor-driven auxiliaries for ship use has reached a point as to reliability and economy of operation where that form of drive is not only trustworthy but offers many advantages besides steam economy, of which silence, cleanliness, saving of space and generally weight, elasticity as to location, etc., might be mentioned. Prime movers in the way of high-grade steam engines with exceedingly low steam rates, as low even as actually obtained in most main engines, are available at moderate costs, and, together with modern generators, offer a means of auxiliary operation many times lower in cost than the steam-driven type. It may be added here that the fuel conservation committee in its investigations and tests of the comparative economies of the two systems reached conclusions exactly in line with the statements made here. The writer is not at liberty to quote figures, which will doubtless be made public in due time, but it may be said that economies of the order of more than 30 to 1 were demonstrated.

The electric drive should include deck auxiliaries as well as engine room. Electric-driven windlasses, capstans, steerers, hoists, etc., are no novelty and are well proven. The electric mooring winch has established itself although experience with it is not extensive, but the same thing is true of many other items which are now usual and familiar to all. Conservatism, which is in general camouflaged inertia, is the principal difficulty in the way.

Importance of Auxiliary Consumption

This would do away with some thousands of feet, of piping with its joints, fittings, coverings, costs and leaks, and, most important of all, radiation and condensation losses. The steam and exhaust lines which now extend all fore and aft absorb many hundreds of dollars every year. Again and again attention needs to be directed to the fact that every auxiliary means another steam line and an exhaust line to keep it company, with all the trimmings, and that the consumption due to the actual work done is only part of the total cost. Radiation and condensation losses proceed just the same whether the auxiliary is in use or not and just as long as steam is on the lines. Let any engineer of a modern ship imagine, if he can, what his fuel consumption would be with every outlet from the boilers closed and tight. The difference between that condition and that existing with all lines open is an incomplete measure of radiation losses outside of the boilers themselves; incomplete because under such a condition radiation losses in exhaust lines would not be included. The objective then is the closest practicable approach to this minimum radiation condition and is only feasible through elimination of piping. The elimination of auxiliaries thus comes near to a realization of getting something for nothing.

It has been usual to estimate the auxiliary steam as about 15 per cent of the total at normal duty, but studies of the modern ship indicate that the figure is more nearly 20 per cent. No information is available of recent actual weighed tests but it is not difficult to arrive at an approximation by comparison with earlier weighed trials.

To sum up the situation as regards the independent steam-driven auxiliaries as a whole it may be stated without any exaggeration that if the owner would hoist out the whole lot and throw them overboard he would be making money faster than by carrying cargo. Electric-generating equipment is, of course, excepted, it being assumed, however, that in carrying out the electrification program something of a higher order as to economy than now customary would be installed.

The foregoing suggestions apparently leave the forward end of the ship without heat, but with so many well-tried heating systems available and ideal conditions as to location and a choice of fuels one is inclined to suggest that the move toward economy might begin forward and move aft. There is more in this suggestion, moreover, than meets the eye.

If electrification is carried out as completely as suggested here, the steam and exhaust lines will be practically reduced to the service of the generator sets. The exhaust steam available for feed water heating would then be reduced to these sources and readily absorbed, preferably in a contact or open heater rather than a closed heater thus conserving every unit of heat and all condensate. The contact heater involves a water supply from some source but this can be arranged by gravity from overboard and from the air pump discharge. Heat for the after accommodations can be supplied from the exhaust line, supplemented by live steam when necessary, and all drainage direct to the contact heater. The contact heater moreover has the additional great advantage of effecting separation of a considerable part of the suspended impurities in the feed water at a point always easy of access for removal and without loss of heat. It weighs and costs very little more than the closed type but is 100 per cent effective in heat transfer which the closed type never can be even when perfectly clean and free from air traps.

(To be continued)

The personnel of the active documented vessels of the United States during 1926 totaled 217,193, according to merchant marine statistics for 1926 made public by the department of commerce.

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Whitlock WATERFLEX Rope should not be confused with the various makes of cordage which are offered as superior to "ordinary" rope. It is obvious that all brands not possessing the patented Whitlock water-resisting feature should be classified as of the ordinary type when contrasted with WATERFLEX, because of the latter's many outstanding advantages.

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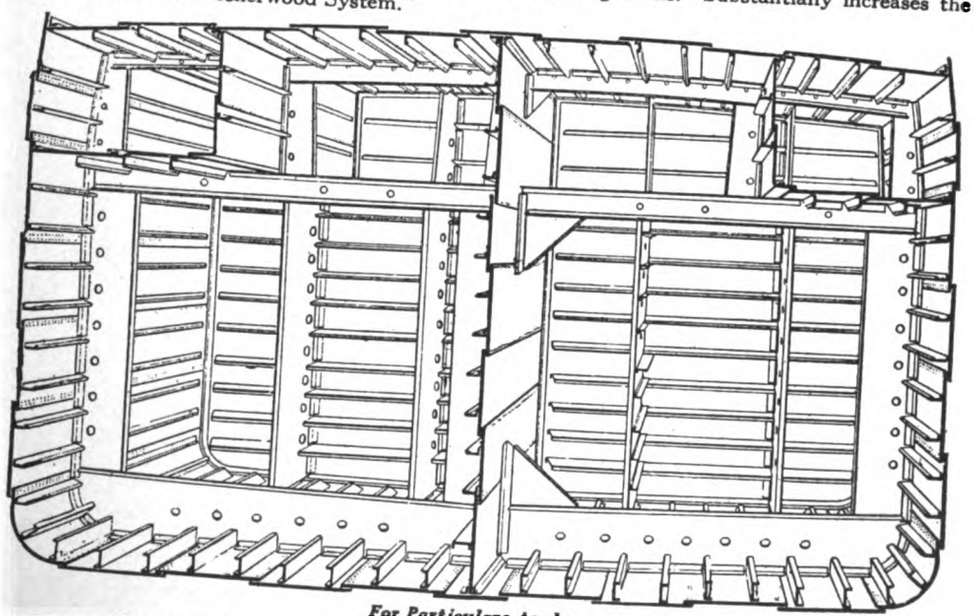

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Barge Canal Terminal

(*Continued from Page* 27)

ators always look ahead to determine whether there is a suitable place to discharge the cargo before they accept it. So then if it is impossible to discharge the cargo the shipment is never made, and people at the point in question are the last to hear about it. A case in exception to this rule is that of a Brooklyn and Buffalo line barge which arrived at New York loaded and was unable to discharge at the Mott Haven terminal on account of congestion there, but the exception is not complete in that the operators of the barge knew of other places where delivery could be made. Terminal facilities at successful ports the world over must be and always are in excess of actual traffic demands, otherwise that port would lose potential traffic without ever being aware of it. It is fortunate for the state rather than the reverse that the terminals have been built and are available even though they are little used.

Rail Connections Are Arranged

Several of the terminals are very extensively used for canal traffic, these being Gowanus bay and Pier 6, East river, in New York and Erie basin in Buffalo. A number of others, such as Mott Haven in New York, are extensively used for noncanal traffic.

Railroad tracks have been installed on a number of the terminals and physical connection established with nearby railroads as the following table shows.

Railroad Tracks on Terminals

Terminal	Connection
Albany	Delaware and Hudson
Buffalo (Erie Basin)	New York Central
Oswego (Lake)	Delaware, Lack. & Western
Rochester	Lehigh Valley
Syracuse	Delaware, Lack. & Western
Troy	Boston and Maine
Utica	(No connection)

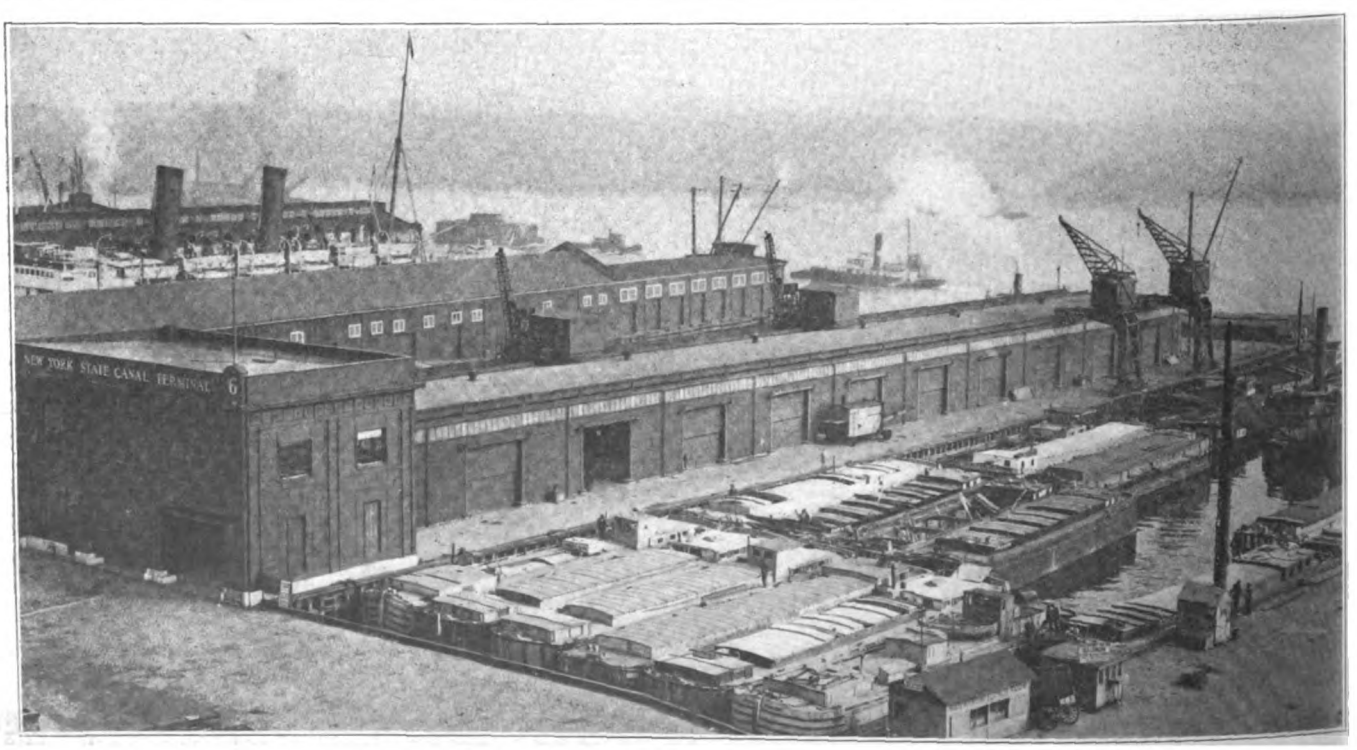
At Utica tracks have been laid but no connection made with the only railroad available, the New York Central, chiefly because of local opposition to a grade crossing of North Genesee street, which is obviously the shortest and cheapest possible connecting line. No other immediate remedy for the situation is seen. At Troy, while the direct connection is with the Boston and Maine, this branch is only a few blocks long and gives on the Troy Union railroad, a line jointly owned and operated by the Boston and Maine, Delaware and Hudson and Boston and Albany. At Rochester a short stretch of Lehigh Valley trackage gives connection with the new Industrial railway which in turn has or will have one or more connections with every railroad and suburban electric line entering the city. The physical situation as to tracks on terminals and connections therewith is favorable in the main for the uses which are described farther on.

No review of the terminal situation would be complete without reference to the grain elevators at Gowanus bay and Oswego. The former has a capacity of 2,000,000 bushels and was first used on Aug. 8, 1922. It has been of the greatest value to the canal, and has been the cause of increasing enormously the tonnage carried by becoming a place where any barge can be unloaded without having to wait around the harbor for delivery to some steamship. This matter is more important than it seems for the reason that barges travel in fleets and the fleet as a whole cannot start back on another trip until all barges are unloaded and otherwise ready. In fact, the capacity of the elevator is already outgrown.

Grain Elevators Attract Traffic

Barges of the Interwaterway type are unsuited for laying alongside ship on account of their large size, therefore they are under the necessity of discharging at some elevator. Not only does the tonnage capacity of barges of this type already form a large percentage of the capacity of all of the barges in service, but there is reason to believe that they are the representative barge of the future and will therefore increase in numbers. That being the case they are entitled to every consideration at present even though they would by no means be the sole beneficiaries of relief of the elevator situation.

What is really needed is more storage space for grain at Gowanus bay. It would best be met by the construction of additional bins, but temporary relief of an acceptable nature will be found in renting harbor boxes as occasion demands, just as the Lacka-



BARGE CANAL TERMINAL PIER 6, EAST RIVER NEW YORK CITY

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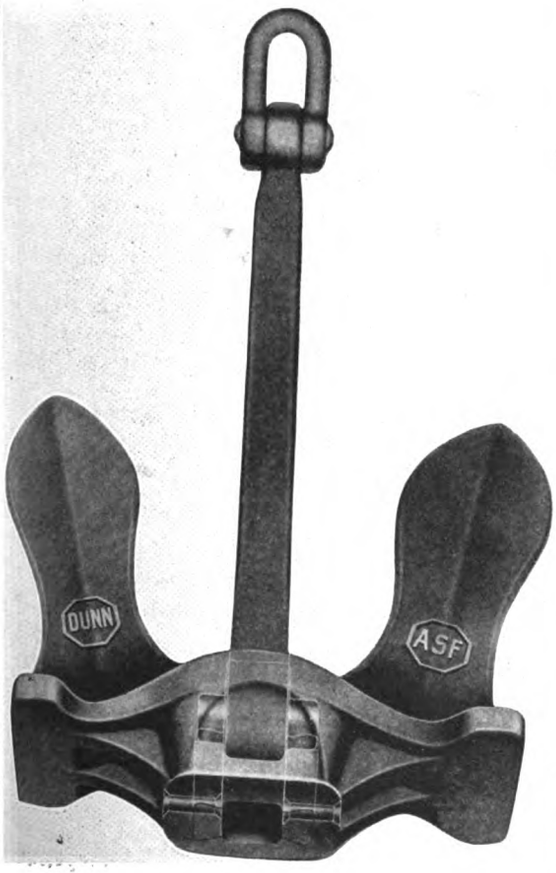

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But I that lighten and revel and roll
With the foam of a plunging sea
No sign is mine of a breathing soul
That God should pity me.

Swinbourne.

WHEN she rolls or pitches in heavy seas, if her seams are tight she'll ride it right and keep her cargo dry.

Old Timers, up and down the coast and 'cross the seas, know that

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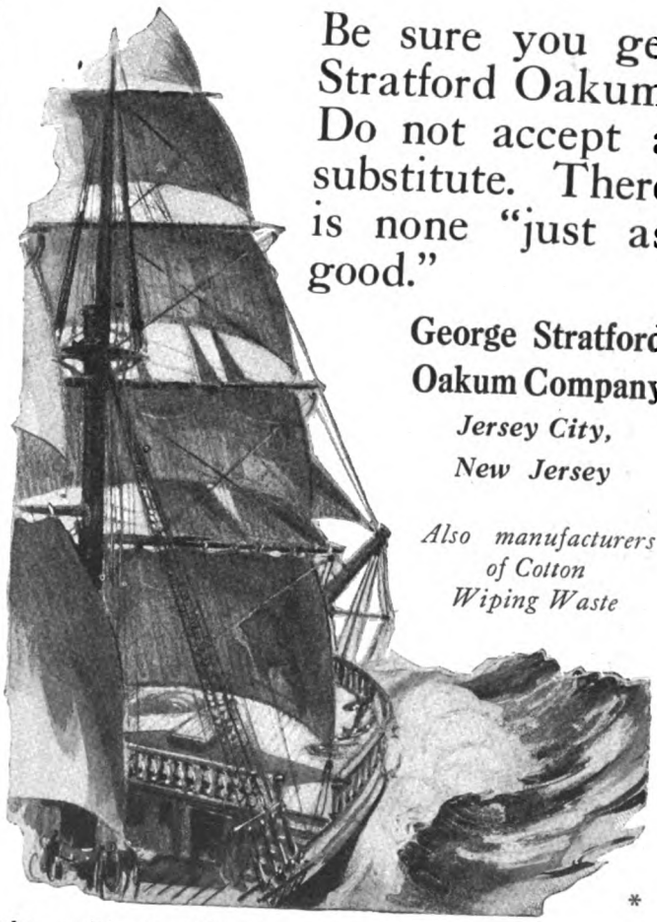
right-caulked into the seams, will make the ship tight and keep the cargo dry. Nearly a century of service has proved its superiority and reliability.



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wanna railroad does now in Hoboken and the Pennsylvania is preparing to do. In the opinion of a competent authority the charges on grain stored in these boxes will equal or exceed the rentals from the owners of them, so that finally the state will at least come out without loss on the transaction as a whole. The total amount of rentals for the period of a year, however, is likely to run to a relatively large amount, probably upward of $100,000, which is expected to be balanced by receipts from storage. If the enterprise can be handled like a private business the only funds needed are $10,000 as working capital, income being used for further rentals.

Use Elevator Seven Months

At present the elevator can be actively used only about seven months in the year plus the time required to dispose of grain stored at the close of the season. To keep a working force of the right kind, however, it is necessary to carry most of the personnel through the winter, when they are used for cleaning up and making minor repairs without being on an actual production basis. If grain arriving by rail during the winter could be brought to the elevator on car-floats it could be handled at sufficient income to pay the interest on the necessary investment and help to pay the winter salaries, in all probability.

When the elevator was constructed the layout was made such as to permit adding railroad tracks and accessories later with virtually no change in the structure as built. The plant now required for the purpose consists principally of railroad tracks, a floatbridge, a transfer table, a small locomotive, a track hopper and a boot. If the canal will assist in maintaining the flow of commerce through the state during the season of navigation it is reasonable to use an accessory of the canal for the same purpose in conjunction with other agencies at other times in view of the broad ground herein taken that the principal purpose of the canal is to increase the prosperity of the state, even to the extent of co-operating with railroads, rather than simply to divert tonnage away from the railroads. If the state expects the railroads to co-operate with the canal the state should expect the canal to co-operate with the railroads.

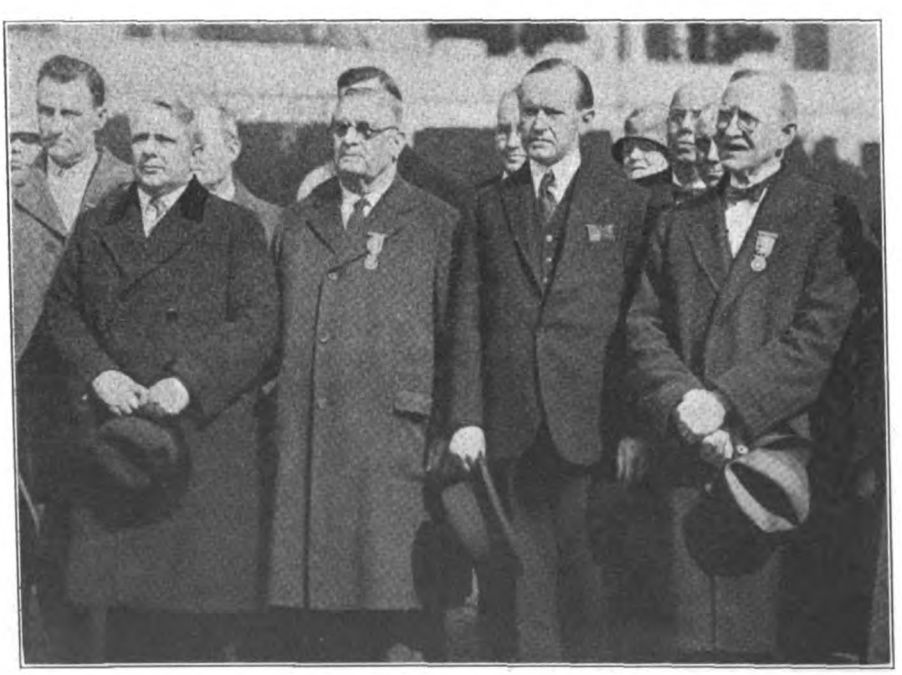
Such improvements as this are warranted because the Gowanus bay elevator is almost a self-sustaining institution when operating at a ½-cent rate per bushel and undoubtedly would yield a handsome return to the state if operated at the 1-cent rate charged at Buffalo. Since receiving the first bushel of grain on Sept. 8, 1922, up to Dec. 1, 1925, the superintendent of public works has reported to the comptroller an income of $356,118.67, an average of about $110,000 a year. The expenditure for personal service at the elevator is stated at page 47 of the superintendent's annual report for 1924 to be $109,437.12 for the fiscal year ending June 30, 1924. The deficit is never large enough to be called a subsidy to the grain trade.

The Oswego grain elevator was not completed for operation until late in 1925. It is likely to be the means of maintaining the flow of at least a part of the export grain through the United States after the Welland canal enlargement shall have been completed and Canadian elevators built at Kingston or Prescott.

Summing up the situation, it may be said that the barge canal terminals are necessary and are ready for use, but that they will not be extensively used until a good packet line is placed in operation. Exceptions to these statements occur at the Gowanus bay elevator, Erie basin, Buffalo, Pier 6, East river, and at other points.

The large plant of the Atlantic Corp. at Freeman's Point, Portsmouth, N. H. used as a shipyard for the building of steel ships during the war, has been taken over by the Atlantic Gypsum Co., which will have plants in New York and Nova Scotia.

Marine Engineers Call on the President



Henry Miller's News Picture Service Inc.

PRESIDENT Coolidge, center, surrounded by members and officers of the National Marine Engineers Beneficial association who called at the White House while holding their national convention in Washington. To the right of the President is W. F. Yates, New York, president of the body, and to the left is A. L. Jones, of Detroit, secretary, with Secretary of Labor James J. Davis, who presented the group to the President to the left of him. Fifteen thousands marine engineers were represented at the convention.

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MARINE DEPARTMENT

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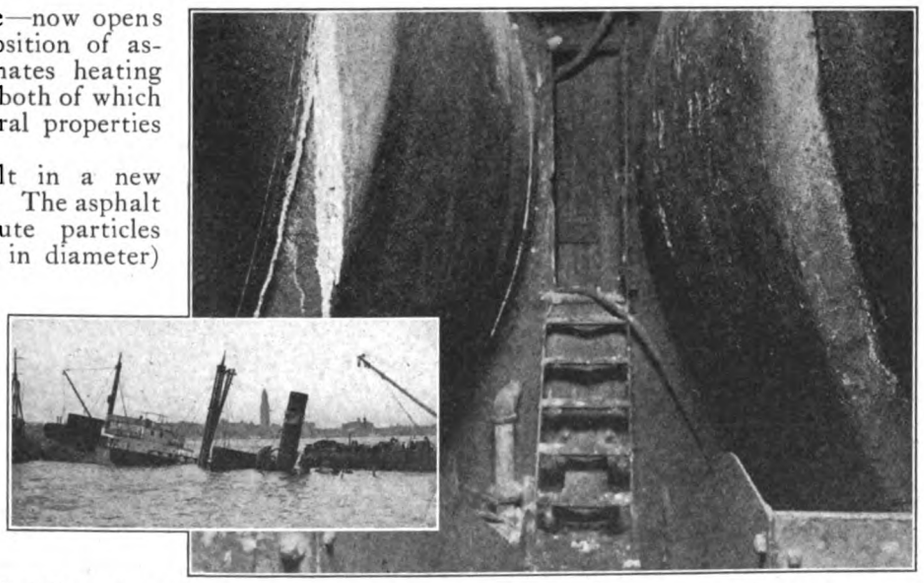
Thorkote Cement or Plastic

gives perfect protection against corrosion

A new product—Thorkote—now opens up a new era in the deposition of asphalt coatings. It eliminates heating and cut-backs or solvents, both of which destroy some of the natural properties of the asphalt.

Thorkote is pure asphalt in a new form—emulsified in water. The asphalt is broken up into minute particles (1/5000 to 1/10,000 inch in diameter) in the presence of an inert mineral colloid which emulsifies it with the water. Thorkote is furnished in the form of Cement or Plastic, and may be applied by brush, trowel, or spraying. The water evaporates and the pure asphalt particles coalesce to form a coating having all the elasticity, ductility and pliability that make asphalt an unrivalled means of permanent protection.

Thorkote users include some of the most prominent ships afloat. List furnished on request.



S. S. Edward Pierce went down in Boston Harbor in 1924. In going down, her bulkheads gave way, causing the cargo of coal to pour into the boiler room. After raising her, it was found that in spite of the water and the abrasion caused by the coal, the 85% magnesia coating of the boilers (covered with Thorkote) were absolutely unimpaired, as the illustration shows.

The Thorkote Products Co., Inc. 135 Liberty Street, New York City *

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Get Conversion Bids

(*Continued from Page* 18)

Owens, Rentschler engine in the SEMINOLE, $625,000; Newport News Shipbuilding & Drydock Co. installation of Busch Sulzer engine in the YOMACHICHI, $527,500; Staten Island Shipbuilding Co., installation of Hooven, Owens, Rentschler engine in the SEMINOLE, $675,000; Tietjen and Lang plant Todd shipyards installation of Hooven, Owens, Rentschler in the SEMINOLE, $579,590 and installation of McIntosh and Seymour double acting engine in the WEST GRAMA, $619,420.

All of the work in connection with the gutting of the ships of their old machinery and auxiliaries and the installation of the new machinery is covered by the above bids. Up to the middle of February four of the twelve vessels to be converted, the TAMPA, UNICOI, WEST HONAKER and WEST CUSSETA had entered service; the CROWN CITY out of Fore River should have her sea trials before March 1; and the three others the SAWOKLA, CITY OF RAYVILLE and CITY OF DAHLHART are approaching completion at Newport News. All the main engines are now completed excepting the M. A. N. double acting unit under construction by the New London Ship & Engine Co. and which it is expected will be completed shortly.

British Naval Architects

The annual meeting of the Institution of Naval Architects will take place April 6, and the two following days in the lecture hall of the Royal Society of Arts, John street, Adelphi W. C. 2, London. His Grace the Duke of Northumberland, K.G. C.B.E. M.V.O. president, will occupy the chair. The annual dinner will be given Wednesday April 6, at 7:30 p. m. in the grand hall, Connaugh rooms, Great Queen street, Kingsway, W. C. Evening dress and orders will be worn. Tickets for the dinner will be 15 shillings each, exclusive of wine.

Old Boiler Plant Sold

The Continental Iron Works, Brooklyn, will be liquidated as of March 1. This is one of New York's historic plants, dating back to 1859. The company manufacturers marine boilers and other marine equipment, and also a line of wood pulp digestors, oil stills, etc. The discontinuance of the business is due principally to the let-down in shipbuilding since the war.

Launch S. S. Evangeline at Cramp's Yard

The steamship EVANGELINE second of two palatial ocean going vessels being built for the Eastern Steamship Co. was launched Feb. 12, at 11:00 a. m. at the yard of the William Cramp & Son Ship & Engine Building Co., Philadelphia. A sister ship, the YARMOUTH, left the ways at the Cramp yard Nov. 6, last year. It is expected that both vessels will be ready for service by early summer.

The EVANGELINE was christened by Miss Betty Dumaine, daughter of F. C. Dumaine, a director of the Eastern Steamship Co. On the launching platform with Miss Dumaine was a party of distinguished shipping men with their friends. The guests were entertained at luncheon at the ship yard and Miss Dumaine was presented with a beautiful silver traveling clock by J. Harry Mull, president and general manager of the Cramp company.

It is expected that the YARMOUTH will be delivered early in May and the EVANGELINE will be ready about a month later. These vessels are to run between Boston and Yarmouth, Nova Scotia and New York and Yarmouth. One will make the trip from Boston every other day and the other will make two round trips a week from New York. The speed of these vessels will be 18 knots and they are equipped to carry a total of 734 passengers each. The furnishing and appointments will be on a lavish scale. Particular attention has been given to the cargo space with a view to carrying automobiles. Electric freight elevators are to be installed.

The vessels are 377 feet 3 inches in length over all and 55 feet in molded beam. The molded draft will be 18 feet. They are of three-deck superstructure type, having a continuous promenade deck and a boat deck making five decks in all. The propelling machinery consists of single reduction geared turbines driving twin screws, steam being supplied by six single ended scotch boilers fitted for burning oil.

Heads Panama Line

Thomas H. Rossbottom was recently elected first vice president of the Panama Railroad Steamship line to succeed the late E. A. Drake. This places Mr. Rossbottom in charge of the line he started with 40 years ago as office boy. When the United States lines was organized five years ago he was borrowed from the Panama line and made manager. He resigned from this position only recently to take up active service again with his old line in his former capacity as second vice president. His recent elevation places him in complete control of operation of the Panama line though on account of government ownership, the governor of the Panama canal, Col. M. L. Walker, is the president.

January Lake Levels

The United States Lake survey reports the monthly mean stage of the Great Lakes for the month of January as follows:

Lakes	Feet above mean sea level
Superior	601.44
Michigan-Huron	578.20
St. Clair	572.88
Erie	571.13
Ontario	245.28

Lake Superior is 0.20 foot lower than in December and it was 0.99 foot higher than the low January stage of a year ago. Lakes Michigan-Huron are 0.05 foot lower than in December and Lake Erie is 0.33 foot lower than in December and it was 1.09 feet higher than the low January stage of a year ago. Lake Ontario is 0.14 foot lower than in December and it was 1.00 foot higher than the January stage of a year ago, 0.20 foot above the average stage of January of the last ten years.

Order Auxiliary Diesels

The receipt of a fourth repeat order for auxiliary diesel oil engines from the United States shipping board was announced recently by the Worthington Pump and Machinery Corp. This brings the total of diesel auxiliaries ordered from Worthington since April, 1925, when the board's dieselization program was launched, to twenty-one.

The engines are all two-cycle, single-acting diesels of the air-injection type, and are employed for operating engine-room and deck machinery and supplying electricity for lighting purposes. Six are already in use on the motorships, TAMPA and UNICOI, both of which are equipped with Worthington double-acting, two-cycle main engines, the first main engines completed under the board's conversion program.

Twelve others are awaiting installation on the motorships, SAWOKLA, CITY OF RAYVILLE, CITY OF DALHART, and YAMACHICHI, all of which are still under construction. The latest order is for three engines. The vessel upon which these will be installed has not yet been chosen.

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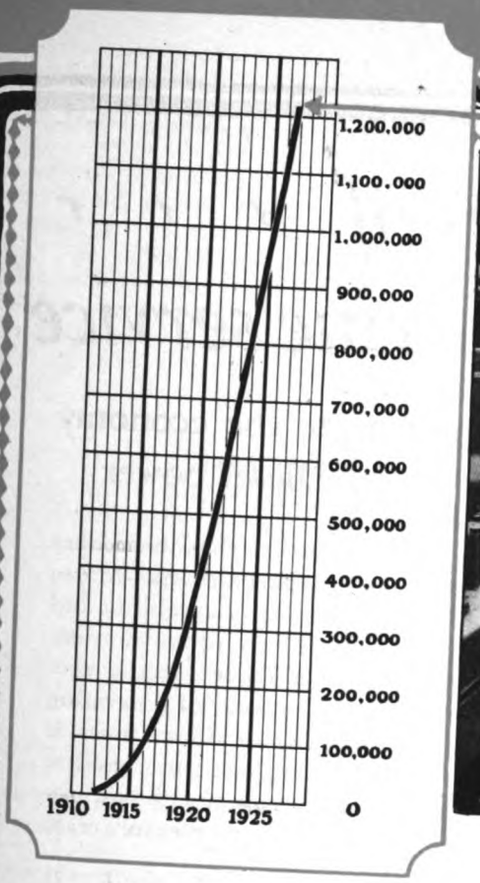

Growth

...swift , , sturdy , , unprecedented

Your proof of F-M leadership

No other Diesel was ever so rapidly accepted as has been the F-M Diesel.

2400 per cent increase in 12 years! Probably the most rapid sales growth of any prime mover of any kind for either marine or stationary use.

Back of this acceptance is a record of practical performance that began with the installation of the first F-M Diesels and has become more and more firmly established each year since.

And behind the record is the principle that made the record possible—the original and consistently followed Fairbanks-Morse principle—valveless two-stroke-cycle construction with airless fuel injection.

When you choose a Fairbanks-Morse Diesel you choose the engine that has been stamped superior to all others by the consensus of buying opinion.

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DIESEL ENGINES

THE PRODUCT OF EXPERIENCE

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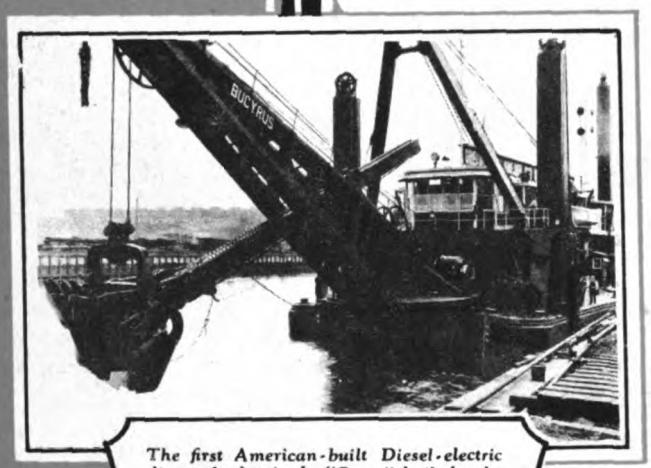
All classes of marine service

Demonstrate the economy of F-M Diesel power

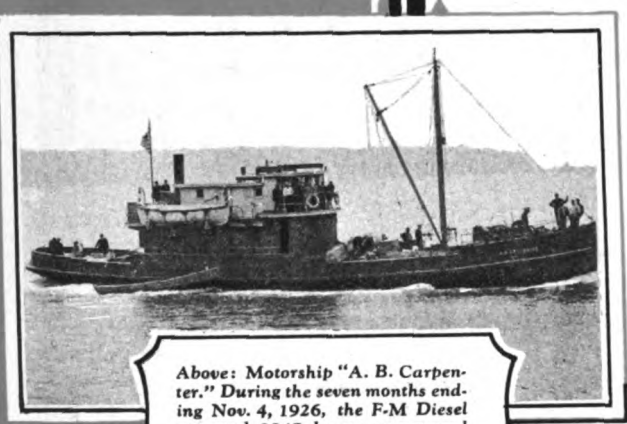


The first American-built Diesel-electric dipper dredge is the "Crest," built by the Bucyrus Company for the Great Lakes Dredge & Dock Co., and equipped with two Fairbanks-Morse 720-hp. Diesels and one 120 hp. standby unit.

On every coast, and on the inland lakes and waterways, the Fairbanks-Morse Diesel has proved its adaptability and versatility. As a direct propulsion engine, as part of a Diesel-electric propulsion unit, and as part of generating and air-compressor auxiliary units, it has demonstrated value on motorships, tugs, schooners, ferries, river boats, fishing boats, dredges—even pleasure craft.

Always the result is the same—operating costs about one-fourth the cost of steam power—low maintenance due to simplicity—quality construction made possible by the world's largest Diesel plant.

The illustrations opposite suggest the range of Diesel applications—they may suggest a solution to *your* problem.



Above: Motorship "A. B. Carpenter." During the seven months ending Nov. 4, 1926, the F-M Diesel operated 2347 hours—one record continuous run of 216 hours.

Fairbanks-Morse Marine Diesels are built in sizes from 20 hp. up to 720 hp. —as propulsion engines and as built-in parts of auxiliary generating or Diesel-electric units. Ask for bulletin describing types in which you are interested.

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FAIRBANKS-MORSE DIESEL ENGINES

THE PRODUCT OF EXPERIENCE

AOA27.72

Motorship "Redfern," once a barge, now equipped with two 120 hp. F-M Diesels; capacity 1400 tons. Typical of many conversion applications.

The "V. J. Kurzweg," opposite, is typical of river boats using the F-M Diesel. It is equipped with a 240-hp. engine.

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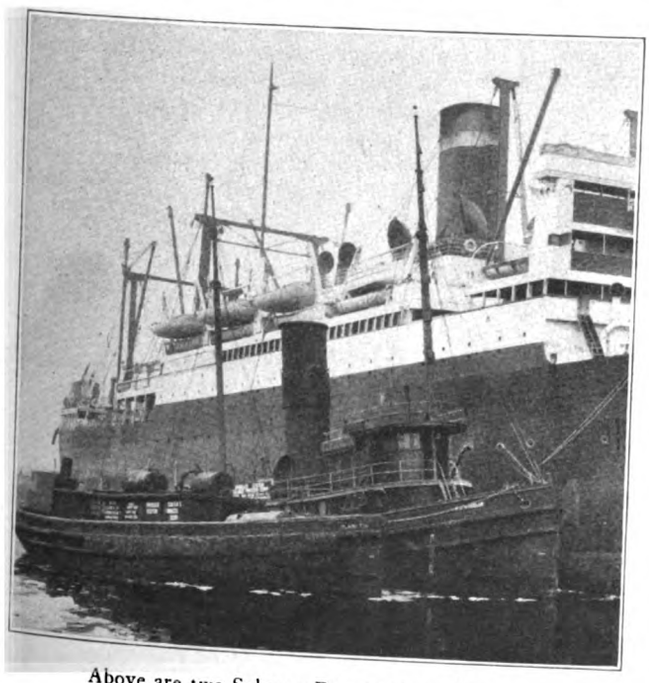

Above are two Salvage Process Corp. Barges cleaning tanks on S. S. President Roosevelt

Salvage Process Corporation

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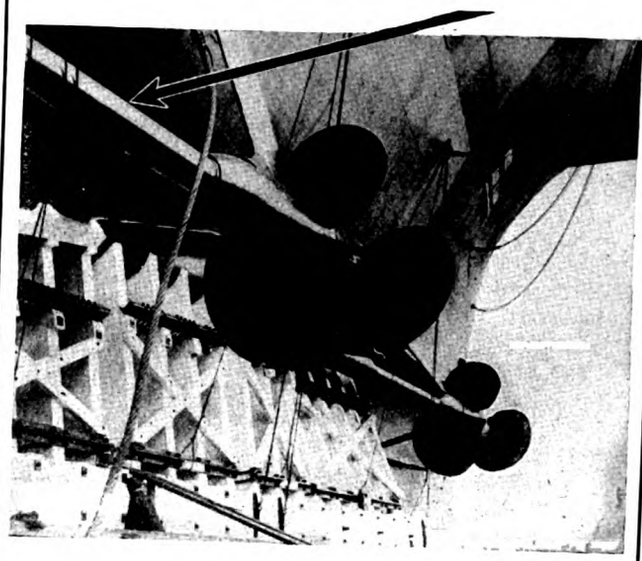
"U. S." Rubber Sleeves Prevent Corrosion



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What the British Are Doing

Short Surveys of Important Activities in Maritime Centers of Island Empire

BRITISH shipyards are gradually getting to work but operations are delayed at several big centers by the shortage of steel. At Harland & Wolff's east yard Belfast the keel has been laid of the first of the five passenger liners ordered by the Royal Mail Steam Packet Nelson line. The shortage of steel has held up the construction of nine cargo vessels for the King line and four tankers for Andrew Weir & Co. At the Greenock yard of Harland & Wolff a cargo steamer for the Nourse line is to be built and when steel is available the machinery for the ship will be constructed in the firm's Belfast engineering works.

* * *

EARLE'S shipyard of Hull has received an order for a 2500-ton specially designed steamer for grain carrying on the Great Lakes of Canada. A large number of men will be employed at high pressure to complete the order in the specified time. Similar ships have been constructed previously in the same yard.

* * *

ACCORDING to returns of shipbuilding on the Clyde only one vessel was launched in January as compared with 12 vessels in the corresponding month of last year. The ship was the REYNOLDS of 5209 tons built by Robert Duncan & Co., Port Glasgow. Among the contracts booked in January was a cruiser of 10,000 tons for the admiralty to be built by the Fairfield Shipbuilding & Engineering Co., Govan, two motor tankers each of 15,600 tons for Imperial Oil Ltd., to be built by Alexander Stephen & Sons, Linthouse; a motor cargo vessel of 10,000 tons dead weight for the Clan Line Ltd. to be built by the Greenock Dockyard Co. Ltd., Greenock, and a cargo steamer of about 9400 tons to be built by Napier & Miller Ltd. for Messrs. Raeburn & Verel, Ltd., Glasgow.

* * *

WILLIAM GRAY & CO. LTD., West Hartlepool has launched from its central shipyard the steel screw steamer WARLABY specially designed for grain carrying and built to the order of Sir R. Ropner & Co. Ltd., West Hartlepool. The vessel is built to the highest class in Lloyds register and is 420 feet long, 55 feet wide and the depth molded to upper deck is 28 feet 9 inches. For the quick handling of cargo ten powerful steam winches are provided which work 12 derricks. The vessel will be completed in all respects as a first class cargo steamer.

* * *

THE Wallsend Slipway & Engineering Co. has secured an order for the boilers for the Singapore floating dock which is to be built by Swan & Hunter at Wallsend. The latter firm has also booked a contract for repairing the Newcastle steamer SHEAF ARROW which was in collision in the Seine with the Newcastle steamer EMILIE DUNFORD.

* * *

THE White Star Line Ltd. has now been registered as a British company with a capital of £9,000,000. This marks the final step in the struggle for the ownerhip of the famous line which culminated in Lord Kylsant's dramatic purchase at a price just over £7,000,000 in November last after previous negotiations between the American owners the International Mercantile Marine and Furness Withy Ltd. had broken down. The company has been formed to enter into agreements with the Royal Mail Steam Packet Co. and the British Foreign & Colonial Corp. Ltd. The capital is divided into 5,000,000 6½ per cent cumulative preference shares and 4,000,000 ordinary shares. The whole of the ordinary share capital has been subscribed by the Royal Mail but £2,500,000 of the preference shares will be offered to the public. The White Star line is acquiring the large and modern steamers OHIO and ORCA from the Royal Steam Packet Co. which will be operated between Liverpool and Canada under the names of ALBERTIC and CALGARTIC.

What's Doing Around The Lakes

LAKE shipping figures of the South Chicago chamber of commerce show that freight from docks of the Calumet steel district last year totaled 21,209,774 tons, of which 10,347,115 tons left the port of South Chicago, and 10,862,659 tons left the ports of Indiana Harbor and Gary, Ind. The Illinois Steel Co. was the largest individual shipper, its tonnage for the year amounting to 5,017,886.

* * *

PROPOSALS for an interstate harbor on Lake Michigan, at the Illinois-Indiana boundary line, are before the Illinois and Indiana legislative assemblies. Identical bills have been prepared for both legislatures. The bills propose a contract between the two states for construction, maintenance and operation of a deep water-harbor by a joint commission to be appointed by governors of the two states. Title to be the bed of Wolf lake, now owned by the states, would be deeded to the joint commission for the harbor. With the exception of a small sum for organization expenses, engineers estimate the harbor would be self-supporting from the start.

CHICAGO sanitary district engineers have decided from their hydrographic charts that the levels of the Great Lakes are tending toward a cumulative upward movement. In reporting a slight rise, these engineers declare nature is recompensing for the downward tendency in the past nine years. The decline in 1925 was an abrupt one, however. The rise, the hydrographic charts disclose, was extremely slight. In December the variance was from 0.18-foot in Lake Ontario to 0.04 in Lake Huron. This season's cycle has been unusual, it is

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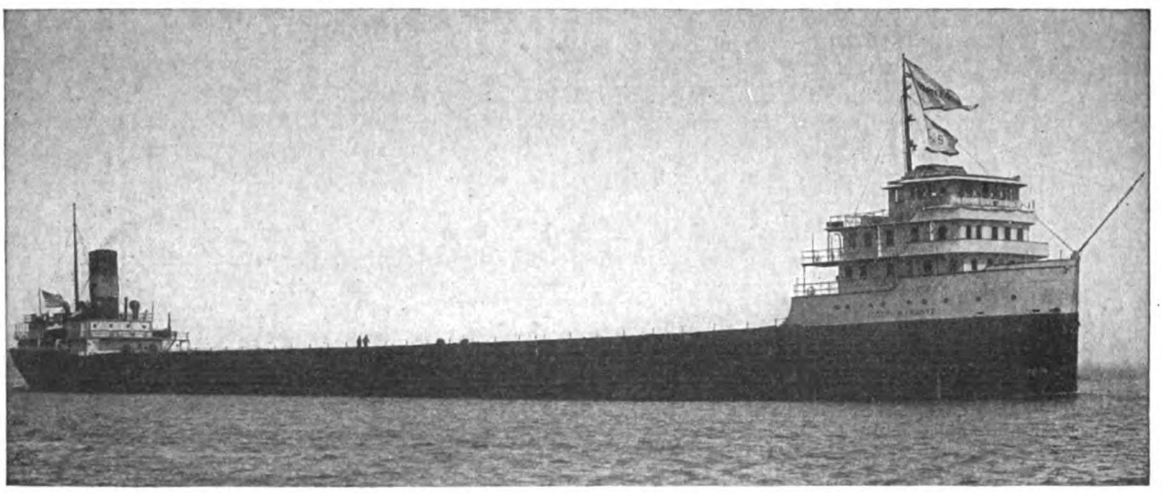

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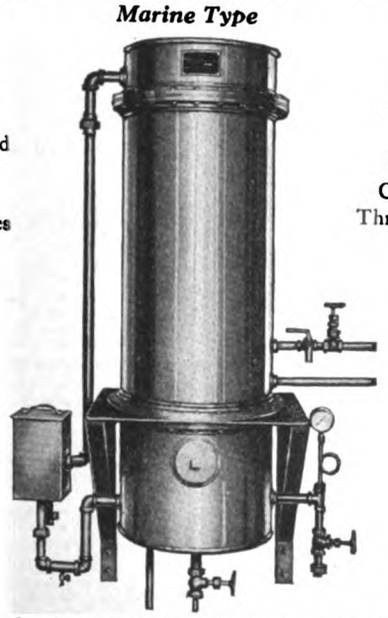

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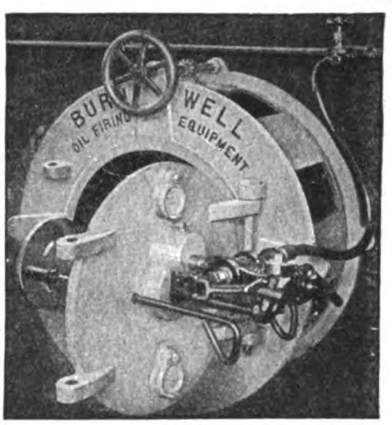

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pointed out, inasmuch as the drop from the summer high to the winter low has been only 0.4-foot.

* * *

GREAT LAKES package and commodity freight shipping the first eight weeks of 1927 has been 8 to 10 per cent in excess of shipping in the similar period last year, lake transportation companies report. The increase has been general, and does not indicate any single activity in freight movement. Weather conditions have contributed to a steady movement, and winter schedules have not been disturbed. The moderate weather of early February dissolved the ice in most ports and has facilitated arrivals and departures.

* * *

REPRESENTATIVE James Arthur, conservative of Parry Sound, in a resolution submitted to the Canadian parliament, Feb. 17, called on the government to ask Washington how Great Lakes levels have been affected by operation of the Chicago drainage canal and its attendant diversion of lake water. The resolution also asked the government to reveal "what instructions have been given the Canadian minister to the United States to make claim for damages sufficient to cover the cost of dredging, etc., if such levels have been lowered.

* * *

THE harbor committee of the Chicago Commercial club on Feb. 17 directed its chief engineer, Maj Rufus Putnam, to limit his study of the city's projected harbor to three sites, one of which is near the Municipal pier.

Ocean Freight Rates

Per 100 Pounds Unless Otherwise Stated

Quotations Corrected to Feb. 18, 1927 on Future Loadings

NOTE: FREIGHT RATES STEADY BUT WITH DECREASE TO SOME PORTS

New York to	Grain	Provisions	Cotton (H. D.)	Flour	General cargo cu. ft.	General cargo 100 lbs.	††Finished steel	REMARKS Freight Offered
Liverpool	2s 6d	$0.60	$0.40	0.25	$0.50	$0.50	$8.00T***	Fair
London	2s 6d‡	0.60	0.40	0.25	0.50	0.90	8.00T***	Fair
Oslo	$0 18	0.50	0.50	0 35	0.50	1.00	8.00†	Fair
Copenhagen	0 18	0.50	0.50	0 35	0 50	1.00	8.00†	Fair
Hamburg	0 17	0.55	0.50	0 23	0.50	0 90	10 00T	Good
Bremen	0.17-21	0.55	0.50	0.23	0.50	0.90	10.00T	Firm
Rotterdam and Amsterdam	0 18	0.32½	0 60	0.25	0.45	0.80	9 50T	Fair
Antwerp	0 17	0.32½	0.45	0.25	0.45	0 80	9 50T	Fair
Havre	0 16	0 55	0.50	0.35	0 45	0 80	8.00T	Fair
Bordeaux	0.16	0 55	0.50	0 35	0.45	0.80	8 00T	Fair
Barcelona	....	0.50	0.30	10 00	—12.00T—		10.00 to 15.00T	Slow
Lisbon	....	0.75	0.50	8.00T bags	—23 00T—		8.00T	Fair
Marseilles	....	0.65	0.40	7.00 bags	—23.00T—		8.00T	Fair
Genoa	0 20	14.25	0.50	9.00	—23.00T—		11.50T	Fair
Naples	0.20	14 25	0.50	9.00	—23.00T—		11 50T	Fair
Constantinople	0.35	20 00T	0 85	0 38	—24 00T—		10.50T	Fair
Alexandria	....	20.00T	0.85	0 40½	—24 00T—		10.50T	Fair
Algiers	....	0.85	0.60	0.45	—23.00T—		11.50T	Fair
Dakar	....	17.00	....	15 50T	—23.00T—		11.50T	Fair
Capetown	....	18.00	....	13.00	20 00		13.00	Fair
Buenos Aires	....	22 00T	....	....	20.00 to 22.00T†		3.00 to 8.80T	Fair
**Rio de Janeiro	....	22.00T	....	8.00 to 8.80T	20 00 to 22.00T†		7.00 to 7.70T†	Fair
Pernambuco	....	22.00T	....	9 00T	—22.00T—†		9.70T†	Fair
Havana	0.22½*	0.50	....	0.30*	....	....	4.00	Fair
Vera Cruz	....	0.30	0.35	0.25	0.52½	1.05	0.30 to 0.35	Fair
Valparaiso	....	1.07	....	0 70	....	....	10 00T	Fair
San Francisco	....	0.35 to 0.70	....	0.40 to 1.10	....	....	0.25 to 0-30	Fair
Sydney	....	18.00T	1.25	18.00T	18 00-24 00T		9.00 to 11.50T	Fair
Calcutta	....	....	0.75	10 00T	—16.00T—		10.00T	Fair

From North Pacific Ports to	Lumber Per m. t.
San Francisco	$4.50 to 5.00
South California	4.50 to 5.00
Hawaiian Islands	9.00 to 10.00
New Zealand	16.00 to 19.00
Sydney	13.50 to 14.00
Melbourne-Adelaide	13.50 to 14.50
Oriental Ports	9.00 to 10.50
Oriental Ports (logs)	13.00 to 14.50
Peru-Chile	12.50 to 15.00
South Africa	17.00 to 20.00
Cuba	15.00 to 17.00
United Kingdom	80s to 95s
United Kingdom (ties)	....
Baltimore-Boston range	$13.50 to 14.50
Florida Range	No rates
Buenos Aires	15.00 to 17.00

Flour and Wheat	
U. K. and Continent (gross ton)	36s 0d to 40s 0d
Oriental Ports (net tons)	$4.15 to 5.00

T—Ton. ‡Per quarter of 480 lbs. †Landed. ††Heavy products limited in length. *Extra charge for wharfage. **Plus $0.50 surcharge on all rates to Rio de Janeiro on account of congestion. ***Plus 15 per cent.

NOTE: Lighterage rates on fuel in New York reduced from 6½ to 5½c per barrel. The coal strike in Britain is now settled and freight rates or bunker prices for coal or pig iron are again quoted.

General cargo rates to Havana change daily and are omitted for the time being.

Rates to Calcutta are subject to change without notice. Cotton goes only to Bombay.

Principal Rates To and From United Kingdom

	s	d
Grain, River Plate to United Kingdom	26	6
Coal, South Wales to Near East	12	0
Coal, United Kingdom to Buenos Aires	13	6
Manganese Ore, Poti to Philadelphia	$5.75	

	s	d
Pig iron, United Kingdom to New York or Philadelphia	15	0
Iron ore, Bilbao to Cardiff	6	3
Iron ore, Huelva to Phila. or Balto	12	0

Bunker Prices

At New York

	Coal alongside per ton	Fuel oil alongside per barrel	Diesel engine oil alongside per gallon
Apr. 22, 1926	5.25@5.60	1.80@1.81½	5.75c
May 19	5.25@5.60	1.80½	5.88
June 18	5.50@5.60	1.80½	6.08
July 20	5.00@5.60	1.80½	6.08
Aug. 12	5.00@5.60	1.81½	6.10
Sept. 18	5.45@6.00	1.81½	6.05
Oct. 22	7.25@7.50	1.70½	5.86
Nov. 19	7.00@7.50	1.81½	5.87
Dec. 20	6.25@6.50	1.81	5.86
Jan. 19	5.90@6.15	1.81½	5.87
Feb. 18, 1927	5.25@5.50	1.81½	5.95

At Philadelphia

	Coal trim. in bunk per ton	Fuel oil alongside per barrel	Diesel Eng. oil alongside per gallon
Apr. 22, 1926	5.25	1.77@1.86½	5.90@5.93c
May 19	5.25@5.70	1.82@1.86½	6.15@6.38
June 18	4.90@5.15	1.80@1.86½	6.15@6.43
July 20	5.10@5.50	1.74@1.81½	5.90@6.15
Aug. 12	5.00@5.25	1.69@1.74½	5.75@6.17
Sept. 18	5.00@5.35	1.74@1.74½	6.14½
Oct. 22	7.25@7.50	1.74@1.80½	5.66@5.88
Nov. 19	7.00@7.50	1.80½@1.81	5.43@5.88
Dec. 20	5.50@5.75	1.80@1.80½	5.64@6.19
Jan. 19	6.20	1.95@1.95½	5.88@6.19
Feb. 18, 1927	5.24@5.50	1.90@1.91	5.64@6.13

Other Ports

Boston, coal, per ton	$8.85
Boston, oil, f. a. s., per barrel	$1.72
Hampton Roads, coal, per ton, f.o.b., piers	$5.25
Jan. 11 — Cardiff, coal, per ton	17s 6d
London, coal, per ton	—s —d
Antwerp, coal, per ton	26s 0d
Antwerp, Fuel oil, per ton	77s6d
Antwerp, Diesel oil, per ton	97s 6d
British ports, Fuel oil	85s 0d
British ports, Diesel oil	100s 0d

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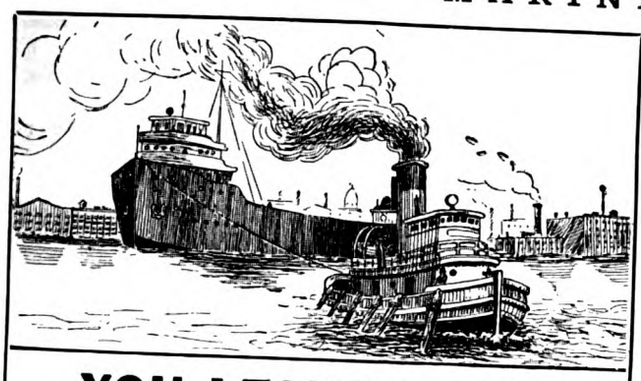

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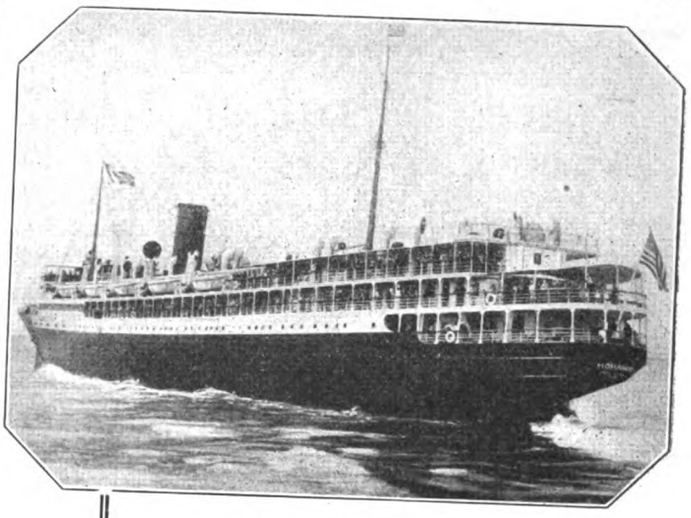

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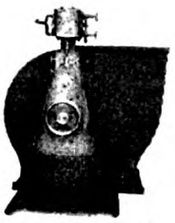

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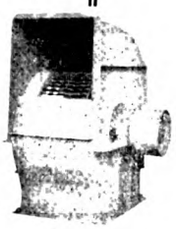

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Late Flashes On Marine Disasters

Brief Summaries of Recent Maritime Casualties— A Record of Collisions, Wrecks, Fires and Losses

Name	Date	Nature	Place	Damage Resulting
Apple Branch	Jan. 13	Collision	Nr. Salaverry	Not stated
Ardito	Jan. 6	Aground	Nr. Toulon	Floated
Amsterdam	Jan. 6	Ashore	Nr. Cuxhaven	Not stated
Acme	Jan. 6	Collision	Liverpool	Not stated
Aggersund	Jan. 27	Collision	New York	Rudder
Adam Smith	Jan. 8	Stranded	Hayle	Floated
Artza Mendi	Jan. 13	Collision	Thameshaven	Windlass
Andalusia	Jan. 13	Collision	Halifax	Not stated
Anaconda	Jan. 31	Collision	Quarantine	Bows
Anthony O'Boyle	Jan. 30	On rocks	Robinson Hole	Abandoned
American Banker	Jan. 31	Collision	Off Gravesend	Stem
Annie Murphy	Feb. 3	Ashore	Wards Point	Floated
Amelia and Jane	Jan. 17	Fire	S. E. of Drummore	Abandoned
Andros	Jan. 25	Struck quay	Marseilles	Stem; plates
Antigoon	Jan. 25	Collision	Scheldt	Amidships
Bright	Jan. 18	Collision	So. of Barnegat	Leaking
Birk	Jan. 20	Collision	River Thames	Serious
Bulko	Jan. 21	Collision	New Orleans	Bow
Brynawel	Jan. 10	Stranded	Middlesbro	Floated
Burpee L. Tucker	Jan. 12	Ashore	Seal Island	Total loss
Borghild	Jan. 13	Collision	Amsterdam	Bows
Baron Semphill	Jan. 31	Aground	Nr. Perth Amboy	Floated
Baracoa	Feb. 3	Ashore	Baracoa	Floated
Balmaha	Jan. 15	Collision	Not stated	Bulwarks; plates
Benalla	Jan. 14	Aground	River Tees	Floated
Bertha	Jan. 17	Collision	Nr. Roedskaer	Portside
Braywood	Jan. 20	Stranded	Scroby Sands	Floated
Bockenheim	Jan. 18	Stranded	Rotterdam	Not stated
Briska	Jan. 24	Collision	Antwerp Roads	Forward
Bravo	Jan. 24	Sank	Off Munken Suderoe	
B. O. Borjesson	Jan. 16	Collision	Dakar	Amidships
Chas. Whittemore	Jan. 13	Fire	Boston	Not stated
Chas G. Black	Jan. 14	Aground	Southwest Pass	Floated
Cairnesk	Jan. 13	Fire	Portland	Not stated
Coya	Jan. 19	Struck dock	Tacoma	Rudder; propeller
Cherokee	Jan. 18	Colision	So. of Barnegat	Not stated
Creole	Jan. 21	Collision	New Orleans	Bow
Clan Ranald	Jan. 6	Collision	Whitehaven	Not stated
Calypso Vergotti	Jan. 9	Collision	Piraeus	Bow plates
Clan Monroe	Jan. 14	Aground	Gupta Crossing	Not stated
Clyde Maru	Jan. 28	Disabled	Off Muroran	Lost prop.
Celtic	Jan. 31	Collision	Quarantine	Side
Caraibe	Feb. 7	Ashore	Nr. Tanamo	Not stated
Citta Di Brindisi	Jan. 17	Struck quay wall	Antwerp	Starboard side
Candido	Jan. 19	Collision	Genoa	Not stated
District of Columbia	Jan. 11	Aground	Southwest Pass	Not stated
Dulcino	Jan. 27	Collision	New York	Damaged
Daghild	Jan. 26	Struck pier	St. John	Bow
Drumrock	Feb. 2	Stranded	Takush Harbor	Total loss
Essex Isles	Jan. 14	Explosion	Tampico	Damaged
Englewood	Jan. 14	Disabled	Wilmington	Steering gear
Eastgate	Jan. 4	Collision	Barry	Bridge
Europa	Jan. 5	Stranded	Lekaskagen	Not stated
Elisa Campanella	Jan. 6	Struck dock	Middlesbro	Plate
Errington Dunford	Jan. 6	Collision	Whitehaven	Bow; anchors
Estland	Jan. 10	Ashore	Guadiana River	Floated; leaking
Elma	Jan. 25	Capsized	Nr. Nassau	Floated
Emilie Dunford	Jan. 18	Collision	Rouen	Sank
Elisabeth van Belgie	Jan. 25	Collision	Scheldt	Not stated
Frank R. Diggs	Jan. 26	Collision	Philadelphia	Damaged
Forsvik	Jan. 21	Aground	So. of Warberg	Floated
Fimmo	Jan. 25	Ashore	Nr. Terneuzen	Not stated
Futami Maru	Jan. 23	Stranded	Nr. Utsury Is.	Foundered
Fukuoka Maru	Jan. 23	Stranded	Off Kawajiri Bay	Not stated
G. A. Kohler	Jan. 18	Disabled	Fryingpan Shoals	Not stated
Gillhausen	Jan. 17	Collision	At sea	Above water line
Greenbatt	Jan. 20	Collision	Nr. Brunsbuttel	Port bow
Golden Sea	Jan. 21	Struck pier	Rio Janeiro	Stem; bow-plates
Gonzenheim	Jan. 25	Collision	Off Dungeness	Port side
General Leman	Jan. 25	Collision	Off Dungeness	Not stated
General Botha	Jan. 28	Collision	Immingham	Not stated
Hindustan	Jan. 4	Aground	North Fleet	Floated
H. C. 180	Jan. 18	Collison	Nr. Cuxhaven	Badly
Helene	Jan. 27	Collision	Cuxhaven	Not stated
Ivo Racic	Jan. 9	Collision	Off Dover	Not stated
Izabran	Jan. 29	Ashore	Diamond Shoals	Floated
Jas M. W. Hall	Jan. 31	Aground	Swash Channel	Floated
Juvigny	Jan. 31	Collision	Philadelphia	Part sub.
John Francis Stuard	Feb. 8	Ashore	Nr. Haiti	Not stated
Karroo	Jan. 21	Fire	New York	Nos. 4, 5, 6 holds
Knud	Jan. 10	Collision	Kaiser Wilhelm Canal	Badly
Katori Maru	Jan. 19	Collision	Antwerp Roads	Not stated
Leviathan	Jan. 14	Collision	New York	Sank
Lempira	Jan. 18	Aground	Southwest Pass	Floated
Lake Treba	Jan. 15	Aground	So. of Egmont Key	Not stated
Lake Giddings	Jan. 25	Aground	Philadelphia	Floated
Luftic	Jan. 10	Stranded	Dardanelles	Floated
Lundy Light	Jan. 14	Struck dock wall	Limerick	Stem
Liberty	Jan. 31	Collided pier	Havre	Bows
Ludwigshafen	Jan. 19	Collision	Hamburg	Propeller
Lancing	Jan. 27	Aground	Off Bankside	Starboard; floated
Motorcarline	Jan. 17	Disabled	New York	Engine
Montgomery City	Jan. 18	Fire	Brooklyn	Nos 2 and 3 hold
Mary F. Anderson	Jan. 15	Collision	Off Woods Hole	Head gear; stem
Melvina Anderson	Jan. 20	Sank	Lake Ponchartrain	
Margaret Dollar	Jan. 25	Fire	So. of San Pedro	No. 2 hold
Mars	Jan. 4	Ashore	Terneuzen	Floated
Mistral	Jan. 11	Ashore	Tekslen	Not stated
Manaqui	Feb. 3	Collision	New Orleans	Damaged
M. T. Cicerone	Feb. 6	Ashore	St. Michaels	Bottom
Mosel	Jan. 17	Collision	Nr. Cuxhaven	Not stated
Magdalena	Jan. 18	Collision	Tunis	Not stated
Margo	Jan. 18	Collision	Tunis	Not stated
NR	Jan. 15	Collision	Cold Harbor	Bow
Numidia	Jan. 8	Disabled	Trieste	Steering gear
Niger	Jan. 11	Ashore	Fehmarnsund	Floated
Neptun	Jan. 20	Collision	Nr. Brunsbuttel	Bows
Northumberland	Jan. 25	Struck sub. object	Gisborne	Holed
Osterdal	Jan. 16	Disabled	Valentia	Leaking
O. T. Waring	Jan. 26	Explosion	Mississippi River	Not stated
Ocean Ensign	Jan. 12	Collision	Altona	Not stated
Ophis	Feb. 3	Collision	New Orleans	Damaged
Oden	Jan. 17	Stranded	Norrkoping	Not stated
Orange River	Jan. 20	Collision	Rosario	Plates
Prusa	Jan. 11	Collision	Galveston	Not stated
President Jackson	Jan. 21	Ashore	Shimonoseki	Floated
Pei Hua	Jan. 4	Collision	Tientsin	Forepeak
Primrose	Jan. 12	Aground	Shoreham Harbor	Floated
Quo Vadis	Jan. 20	Collision	Rosario	Not stated
Rockaway Park	Jan. 15	Collision	Cold Harbor	Quarter
Rochdale	Jan. 21	Ashore	River Scheldt	Floated
Rhodesian Transport	Jan. 9	Collision	Off Dover	Plates
Royalstar	Jan. 13	Struck sub. object	Singapore Strait	Holds; tanks
Retuerto	Jan. 25	Aground	Pravia	Totally wrecked
Saskatchewan	Jan. 21	Collision	Owen Sound	Damaged
Sujameco	Jan. 10	Strk. submgd. object	New Bedford	Bottom
Suralco	Jan. 25	Disabled	Balboa	Engine
Swinley	Jan. 4	Collision	Barry	Not stated
Sheila	Jan. 3	Ashore	Loch Torridon	Bottom
St. Louis	Jan. 27	Collision	New York	Damaged
Storfors	Jan. 12	Ashore	Bolsaxen	Floated
Sagama River	Jan. 13	Collision	Barry Roads	Not stated
Swiftsure	Jan. 13	Collision	Barry Roads	Frames; plates
Storviken	Jan. 29	Disabled	Nr. St. Johns	Steering gear
Stuart Star	Feb. 3	Collision	Nr. Hull	Damaged
Selwyn Eddy	Feb. 4	Collision	Tarpaulin Cove	Total loss
Sheaf Arrow	Jan. 18	Collision	Rouen	Stem; bows; forepeak
Sfaktiria	Jan. 19	Storm	Chios	Sank
Sava	Jan. 19	Ashore	No. of Constantza	Not stated
Skotfos	Jan. 25	Aground	Moss	Damaged
Silver City	Jan. 26	Struck Rock	Dunvegan	Propeller blade
St. Laurent	Jan. 25	Fire	Montreal	Extensive
Timavo	Jan. 21	Aground	Nr. La Nouvelle	Floated
Trautenfels	Jan. 6	Ashore	Nr. Alhand	Not stated
Tramontane	Jan. 6	Aground	Nr. Toulon	Floated
Tamaye Maru	Jan. 10	Collision	Tientsin	Forepeak; rudder
Tremley T. C. No. 6	Jan. 28	Sprang Leak	Tremley Point	Beached
Topila	Jan. 27	Aground	Nr. Pasadena	Floated
Terje	Jan. 19	Aground	Boston	Floated
Torontonian	Jan. 16	Collision	Dakar	Not stated
Teessider	Jan. 27	Collision	Newcastle-on-Tyne	Bow
Urpeth	Jan. 7	Ashore	Terneuzen	Floated
Vasile Lupu	Jan. 12	Lost tailshaft	Galatz	Sank
Valemore	Jan. 31	Collision	Philadelphia	Not stated
Vav	Jan. 17	Collision	Bandon	Damaged
Western Queen	Jan. 14	Disabled	Charleston	Steering gear
Wilfred	Jan. 3	Aground	Nr. Ramallo	Floated
Woofield	Jan. 6	Aground	Weser	Floated
Westsee II	Jan. 6	Stranded	Arnoev 67N.	Sank
Westpool	Jan. 28	Collision	Nr. Brunsbuttel-koog	Not stated
Ward Line Lighter	Feb. 1	Collision	New York	Stem
W. E. Ogilvie	Jan. 25	Stranded	Palo Alto	Floated
Yawaki Maru No. 2	Jan. 5	Collision	Shimonoseki Straits	Sank

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New Trade Publications

FLOW METERS—A new type of steam flow meteris described in a bulletin by the Brown Instrument Co., Philadelphia. The new principle on which the meter operates to show the passage of steam is fully illustrated.

VOLTAGE REGULATOR—Its quick acting automatic generator voltage regulator is presented in a bulletin by the American Brown Boveri Electric Corp., Camden, N. J. Diagrams of the circuits and illustrations showing the mechanism of the regulator supplement the text.

DIESEL ENGINES—Fulton Iron Works Co., St. Lopis, has issued a booklet describing its four-cycle, air-injection engine, with fully illustrated retails and installations.

RUST PROOFING—Chemical conversions of the surfaces of iron and steel to basic iron phosphates, insoluble in water and permanent in air is the process employed by the Parker Rust-Proof Co., Detroit, described in a catalog put out by that company.

TWIST DRILLS—A new catalog is being issued by the Cleveland Twist Drill Co., Cleveland, in which are contained some new types of drills. Special drills for bakelite and slate, a small jobbers' carbon drill set, a spiral fluted taper shank taper bridge reamer in high speed steel and other special types. A new section of mechanical data is presented, carrying much useful information for the shop man.

SPECIAL ALUMINUM ALLOYS—Aluminum castings of various degrees of hardness for varied purposes are described in a bulletin by the Permold Co., Cleveland. Several characteristic alloys are presented in detail and others suggested for special uses.

DUST COLLECTION—A bulletin by the Dust Recovering & Conveying Co., Cleveland. describes an installation for collection of zinc oxide from a smelter furnace through a bag house.

ROLLED DRILLS—Technical reasons for the design and method of making its drills are set forth in a booklet by the Detroit Twist Drill Co., Detroit. Steps in the development of the rolled drill and comparative strength attained are set forth and diagrams indicate clearly the steps by which the present results were attained.

PLATE VALVES—Automatic plates valves for blowing engines and compressors, as well as other uses, are featured in detail in a bulletin by the Mesta Machine Co., Pittsburgh, drawings of the valves and installations in which they are used being used as illustrations.

COAL AND ASH HANDLING—Webster methods of handling coal and ash to and from office buildings and industrial plants is described in a pamphlet by the Webster Mfg. Co., Chicago. The Strauss building anu the W. F. Hall Printing Co. are the suojects.

ZINC COATING—Metals Coating Co. of America has issued a bulletin describing its method of spraying a coating of metallic zinc on galvanized sheets developing defects or where the galvanized surfaces have been damaged in forming operations.

REFRACTORIES—Ten attractive bulletins have been prepared for distribution by the Chicago Retort & Fire Brick Co., Chicago, covering various phases of use of its products.

STOP AND CHECK VALVES—An equalizing stop and check valve for boiler efficiency manufactured by Jenkins Bros., New York, is featured in a bulletin just issued. Its purpose is to give notice of the condition of steam pressure in each of a battery of boilers, indicating which needs firing, by making possible a separate pressure reading for each. It is fully illustrated.

VACUUM CLEANER—B. F. Sturtevant Co., manufacturers of blowers and other air-moving machinery, has issued a bulletin featuring its vacuum cleaner, a recent development in its chosen line.

CENTRIFUGAL PUMPS—Multi-stage centrifugal pumps manufactured by the Pennsylvania Pump & Compressor Co., Easton, Pa., are described fully in a bulletin just issued by that company. The equipment is illustrated and typical installations are shown. The text describes its advantages for various uses. Several other products of this company also are given space.

ELEVATORS—Two bulletins by the Revolvator Co., Jersey City, N. J., are the first of a series designed to cover the entire line of elevators, lifters, stackers, piling and tiering machines revolving, non-revolving, open end and stationary, and other products of the company.

GENERATING SETS — Standard Turbine Corp., Scio, N. Y., has issued a bulletin describing small turbo generator sets in sizes from ½ to 10 kilowatts.

REFRACTORIES—Fire brick designed to resist the destructive effects of various factors of service are featured in a leaflet by the Ashland Fire Brick Co., Ashland, Ky.

RECORDING VOLTMETERS—Bristol Co., Waterbury, Conn., has issued a catalog covering its various types of recording voltmeters, profusely illustrated to show the instruments, their operation and application to various purposes. The catalog is uniform with others by this company, for filing in its binder set.

CARGO PUMPS—Wilson-Snyder, Pittsburgh, has issued a bulletin featuring its line of cargo pumps for the rapid and efficient unloading of tank cargoes. Details of construction and data are given briefly, with a list of users.

MOTORIZED POWER—General Electric Co., Schenectady, N. Y., has issued a bulletin showing applications of motor power to handling of materials ,from electric locomotives of various sizes to cranes, tiering machine, loaders and unloaders. Halftones are shown.

Business News for the Marine Trade

Mohawk Steamship Corp., Central Savings Bank building, Baltimore, has been incorporated with $100,000 capital by R. E. Lee Young and Richard E. Preece.

Penn Steamship Corp., Central Savings Bank building, Baltimore, has been incorporated with $100,000 capital by R. E. Lee Young and Richard E. Preece.

Automotive Forwarding Corp. has been incorporated at New York with 2500 shares no par value to engage in shipbuilding, by J. F. Mann, B. M. Bosworth and J. R. Daniell. Clark, Carr & Ellis, 120 Broadway, are attorneys.

Commonwealth Paint Co. has been incorporated at Boston to conduct a ship chandlery, ship painting and repair yard, and deal in machinery and appliances for the construction, repair and equipment of ships, with $10,000 capital. George P. Peterson, 72 Hollingsworth street, is president, Karl E. Hurlburt, Hingham, Mass., treasurer, and N. M. Trask clerk.

Mariners' Towboat Co. has been incorporated at Boston with 1000 shares of no par value to operate steamboats, tugboats, lighters and machinery for their control and wrecking. Andrew E. Jacobs, 5 Prospect street, Gloucester, Mass., is president, Loren A. Jacobs treasurer, and E. T. Foley clerk.

Sound Steamship Lines has been incorporated at New York with 1000 shares no par value by M. Miller, M. Samuels and A. Collins. C. C. Schwartz, 19 West Forty-fourth street, is attorney.

Florida Variety Boat Co., Orlando, Fla., is having plans made for a boat construction and repair plant on Lake Conway. Walter C. Meloon is head of the company.

Allan Prangnell & Co., New York, has been incorporated to deal in ships and scows, with $10,000 capital, by A. C. Sherman, A. W. Morrison and W. F. Curran. Fitzgerald, Stapleton & Mahon, 25 Broadway, are attorneys.

Ledo Lighterage Corp. has been incorporated at New York with $1000 capital by J. F. Murray, D. H. Carroll and P. Muylle. E. H. Ball, 110 West Fortieth street, is attorney.

Bids will be opened Jan. 14 for a triple-screw steel fire boat for Seattle, to cost approximately $200,000. Vessel to be 123 feet, 6 inches long over all, with a speed of 14 knots; equipped with six centrifugal fire pumps driven by 30-horsepower gasoline or diesel engines and will also have seven 300-horsepower engines, four of which will be directly connected to fire pumps.

Flandria Boat Corp. has been incorporated at New York with $25,000 capital to do a lighterage business by J. F. Murray, D. H. Carroll and P. Myrlle. E. H. Ball, 110 West Fortieth street, is attorney.

Rushville Steamship Corp. has been incorporated at New York with $20,000 capital by M. Herbert, F. Schliefer and I. Marks. M. Olesker, 570 Seventh avenue, is attorney.

Frank Marra Co. has been incorporated at New York with $5000 capital to conduct a stevedoring business by F. Marra, M. M. Marra and F. A. Heslin. M. R. Latimer, 350 Fulton street, is attorney.

Kanno Boat Builders has been incorporated at New York with $10,000 capital by S. Maritato, M. Maritato and G. Ruggiero. M. J. Esposito, 291 Broadway, is attorney.

Mosteiro has been incorporated at New York with $2000 capital to scale ships by R. Mosteiro, E. J. Love and J. Gevas. C. C. Reeve, Woodhaven, N. Y., is attorney.

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